




September 15, 2008

TO: Steve Ahlsten
HQ Accounting
MS: 47420

FROM: George Humphrey 
Columbia River Crossing Project
MS: S-15

SUBJECT: I-5 Columbia River Crossing Project
David Evans and Associates
Agreement Y 9245 Task AF

Enclosed for further processing is one original of the referenced task order.

If you have any question please call me at (360) 816-8864.

- c. File
 - B. McMullen
 - R. Funkhouser
 - Marilyn Bowman, HQ CSO, MS 47323
 - Document Control

All terms and conditions of this agreement are in full force and effect for this Task Order document.

Agreement No.

(To be filled in by Agreement Manager)

Y 9245

On-Call Agreement Manager Information

Task No.

AF

Agreement Manager George Humphrey	Phone 360-816-8864	Org. 441101	Mailstop S-15
Mailing Address PO Box 1709 Vancouver WA 98668-1709			

Project Manager Information (If different from On-Call Agreement Manager)

Project Manager Douglas P. Ficco	Phone 360-737-2726	Org. 441101	Mailstop S 15
Mailing Address 700 Washington Street, Suite 300 Vancouver WA 98660-3177			

Project Information

Project Title Columbia River Crossing Project	
State Route No(s). I-5	County(s) Clark

Task Schedule

Task Start Date September 1, 2008	Task End Date December 31, 2009
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No payment will be made for work done **PRIOR** to Task Start Date or for work done **AFTER** Task End Date

Task Cost

This section required if there is Fed. Aid Part.

[illegible]

Total Task Amount →	\$21,585,274.00
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Consultant Information

Prime Consultant David Evans and Associates, Inc. - Vancouver		Contact Ron Anderson	
Address 700 Washington Street, Suite 300 Vancouver WA 98660-3177			
Phone 360-737-2726	Fax 360-737-0294	E-Mail andersonr@columbiarivercrossing.	Federal I.D. No. 93-0661195
Are there any Subconsultants working on this project? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, complete the Subconsultant Worksheet and return with signed Task Order.			

Approval Signatures

****Note: Two original signed Documents are required.****

Consultant

Washington State Department of Transportation

Agreement Manager (Signature required for execution of document **ONLY** for Communications and Public Involvement and Environmental Services Agreements)

DOT Form 130-010 EF
Revised 11/2003

Scope of Task Order

Provide description of work and reference attachments for prime consultant and all subconsultants (to include detailed description of work schedule and estimate).

Report Due Date

Perform work on the Columbia River Crossing Project in accordance with the attached scope and estimate.

Distribution: Originals: ☐ Consultant
☐ Accountant

Copies: ☐ File ☐ Consultant Services
☐ Task Manager ☐ Other _____

Subconsultant Work Sheet

Agreement No.	Task No.	Amendment No.	Amount
Y 9245	AF		\$21,585,274.00

Subconsultant Name IBI Group		Contact Paul Lavallee	
Address 506 Second Avenue, Suite 600 Seattle WA 98104			
Phone 206-521-9091	Fax 206-521-9095	E-Mail plavallee@ibigroup.com	Federal I.D. No. 95-3268721
UBI No. 601 557 653	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No. na	Amount \$ \$248,638.00

Subconsultant Name Illumination Arts		Contact Faith E. Baum	
Address 330 Greenwood Avenue, Suite 207 Bloomfield NJ 07003			
Phone 973-771-1556	Fax 973-954-4683	E-Mail www.illuminationart.com	Federal I.D. No. 20 0561013
UBI No. Pending	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$ \$48,750.00

Subconsultant Name John H. Clark, P.E., PhD, Consulting Engineer		Contact John H. Clark	
Address 1889 Broadway Olace Wenatchee WA 98801			
Phone 509-662-6955	Fax	E-Mail johnclark@nwi.net	Federal I.D. No. 54-132 9158
UBI No. 601 866 219	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$ \$120,000.00

Subconsultant Name John Parker Consulting L.L.C.		Contact Jennifer John	
Address 6950 SW Hampton Street, Suite 318 Tigard OR 97223			
Phone 503-502-3785	Fax 503-620-8119	E-Mail www.johnparkerconsultingllc.	Federal I.D. No. 26-1747391
UBI No. 602 802 155	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$ \$10,350.00

Subconsultant Name Leon Skiles & Associates, Inc.		Contact Leon Skiles	
Address 4424 SW Pasadena Street Portland OR 97219			
Phone 503-245-2393	Fax 503-245-2393	E-Mail	Federal I.D. No. 93-1321250
UBI No. 601 557 653	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$ \$113,500.00

Subconsultant(s) Total

\$14,145,276.00

Net Amount to Prime

\$7,439,998.00

Subconsultant Work Sheet

Agreement No.	Task No.	Amendment No.	Amount
Y 9245	AF		\$21,585,274.00

Subconsultant Name Markgraf & Associates			Contact Tom Markgraf		
Address 211 N Ainsworth Portland OR 97217					
Phone 503-285-9549	Fax 503-987-1702	E-Mail markgraf@teleport.com		Federal I.D. No. 542-80-7347	
UBI No. 602 498 114	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$		\$242,000.00

Subconsultant Name Michael Minor & Associates, Inc.			Contact Michael Minor		
Address 4923 SE 36th Avenue Portland OR 97202					
Phone 503-220-0495	Fax 503-775-4646	E-Mail mminor@drnoise.com		Federal I.D. No. 93-1218882	
UBI No. 601 297 868	D/M/WBE Part.? <input checked="" type="radio"/> Yes <input type="radio"/> No	D/M/WBE No. D3M5916853	Amount \$		\$33,766.00

Subconsultant Name Parametrix, Inc. Portland			Contact Jeff Heilman		
Address 700 NE Multnomah, Suite 1000 Portland OR					
Phone 503-233-2400	Fax 503-233-4825	E-Mail jheilman@parametrix.com		Federal I.D. No. 91 0914810	
UBI No. 600 135 349	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$		\$2,647,708.00

Subconsultant Name Parisi Associates			Contact David Parisi		
Address 58 Alta Vista Avenue Mill Valley CA 94941					
Phone 415-388-8978	Fax 415-276-4173	E-Mail		Federal I.D. No. 52-1177029	
UBI No. 602 495 204	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$		\$348,480.00

Subconsultant Name PB Americas, Inc			Contact A. W. Carter		
Address 999 Third Avenue, Suite 2200 Seattle WA 98104-4020					
Phone 206-382-5200	Fax	E-Mail		Federal I.D. No. 11-1531569	
UBI No. 600 275 529	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$		\$2,631,328.00

Subconsultant(s) Total	\$14,145,276.00
Net Amount to Prime	\$7,439,998.00

Subconsultant Work Sheet

Agreement No.	Task No.	Amendment No.	Amount
Y 9245	AF		\$21,585,274.00

Subconsultant Name PB Consult, Inc			Contact Brent Baker	
Address 999 Third Avenue, Suite 2200 Seattle WA 98104				
Phone	Fax	E-Mail	Federal I.D. No.	
			13-4142817	
UBI No. 602 137 126	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$	\$538,899.00

Subconsultant Name Shannon & Wilson, Inc.			Contact Monique Nykamp	
Address 400 N. 34th St. #100 Seattle WA 98103				
Phone 206-632-8020	Fax 206-695-6777	E-Mail man@shanwil.com	Federal I.D. No. 91-0745357	
UBI No. 578 058 207	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No. n/a	Amount \$	\$294,207.00

Subconsultant Name Steven M. Siegel			Contact Steven M. Siegel	
Address 3787 SW Lyle Court Portland OR 97221				
Phone 503-274-0013	Fax 503-274-0084	E-Mail siegelconsulting@aol.com	Federal I.D. No. 101-36-2232	
UBI No. 602 709 048	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$	\$367,000.00

Subconsultant Name Stantec			Contact Gerald Nielsten	
Address 50 W 23rd Street New York NY 10010				
Phone 212-366-5600	Fax 212-366-5629	E-Mail nielsten@vollmer.com	Federal I.D. No. 13 1881649	
UBI No. 602 355 080	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$	\$982,512.00

Subconsultant Name Touchstone Architecture & Consulting, P.A.			Contact Bradley C. Touchstone, AIA	
Address 3011-1 Powell Road Tallahassee FL 32308				
Phone 850-656-7326	Fax	E-Mail	Federal I.D. No. 59-3495233	
UBI No. Pending	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$	\$103,621.00

Subconsultant(s) Total

\$14,145,276.00

Net Amount to Prime

\$7,439,998.00

Subconsultant Work Sheet

Agreement No.	Task No.	Amendment No.	Amount
Y 9245	AF		\$21,585,274.00

Subconsultant Name TW Envirolmental, Inc.		Contact Martha Moore	
Address 136 NE 28th Avenue Portland OR 97232			
Phone 503-235-9194	Fax 503-239-7998	E-Mail	Federal I.D. No. 93 1122186
UBI No. 601 917 082	D/M/WBE Part.? <input checked="" type="radio"/> Yes <input type="radio"/> No	D/M/WBE No. D2F7218259	Amount \$ \$54,758.00

Subconsultant Name Zimmer Gunsul Frasca Partnership		Contact Paddy Tillett	
Address 320 SW Oak, Suite 500 Portland OR 97204			
Phone 503-224-3860	Fax 503-224-2482	E-Mail	Federal I.D. No. 93-0677469
UBI No. 601 074 528	D/M/WBE Part.? <input type="radio"/> Yes <input checked="" type="radio"/> No	D/M/WBE No.	Amount \$ \$282,856.00

Subconsultant(s) Total

\$14,145,276.00

Net Amount to Prime

\$7,439,998.00



ENVIRONMENTAL IMPACT STATEMENT
AGREEMENT NUMBER Y-9245

TASK AF
STATEMENT OF WORK
SEPTEMBER 1, 2008



Title VI

The Columbia River Crossing project team ensures full compliance with Title VI of the Civil Rights Act of 1964 by prohibiting discrimination against any person on the basis of race, color, national origin or sex in the provision of benefits and services resulting from its federally assisted programs and activities.

Americans with Disabilities Act (ADA) Information

If you would like copies of this document in an alternative format, please call the Columbia River Crossing project office at (360) 737-2726 or (503) 256-2726. Persons who are deaf or hard of hearing may contact CRC using Telecommunications Relay Service by dialing 7-1-1.

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ACRONYMS

AA	Alternatives Analysis
AARF	Aggregate Rail Ridership Forecasting
AASHTO	American Association of State Highway and Transportation Officials
APE	Area of Potential Effect
API	Area of Potential Impact
BA	Biological Assessment
CEJG	Community and Environmental Justice Group
CEVP	Cost Estimate Validation Process
CPM	Critical Path Method
CRA	Cost Risk Assessment
CRC	Columbia River Crossing
CSC	Customer Service Center
C-Tran	Clark County Transportation District
DAHP	Department of Archeology and Historic Preservation
DEA	David Evans and Associates, Inc.
DEIS	Draft Environmental Impact Statement
DOE	Determination of Eligibility
DTM	Digital Terrain Model
EIS	Environmental Impact Statement
EGDR	Existing Geotechnical Data Report
EMF	Electro-magnetic fields
ESA	Endangered Species Act
EWG	Environmental Working Group
ETC	Electronic Toll Collection
FAIR	Financial and Institutional Resources Group

FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Act
FHWA	Federal Highway Administration
FOE	Finding of Effect
FOIA	Freedom of Information Act
FTA	Federal Transit Authority
GDR	Geotechnical Design Report
GDSR	Geotechnical Design Summary Data Report
GIS	Geographic Information Systems
HASP	Health and Safety Plan
IAMP	Interchange Area Management Plan (OR)
IAMR	Interchange Area Management Request
IDW	Investigation Derived Waste
IGA	Intergovernmental Agreements
IJR	Interchange Justification Report (WA)
IMR	Interchange Management Report (OR)
LPA	Locally Preferred Alternative
MDR	Methods and Data Report
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
O&M	Operating and Maintenance
OCS	Overhead Catenary System
ODOT	Oregon Department of Transportation
PBR	Preliminary Baseline Report
PE	Preliminary Engineering
PDT	Project Development Team

PMO	Project Management Oversight
PMP	Project Management Plan
PPP	Public-Private Partnership
PSC	Project Sponsors Council
ROD	Record of Decision
RTC	Regional Transportation Council
RTN	Real-time Network
SASS	Sponsor Agency Senior Staff
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office
SimTraffic	Traffic Simulation Software
SOW	Statement of Work
STATES	ODOT and WSDOT
TAC	Technical Advisory Committee
TIFIA	Transportation Infrastructure Finance and Innovation Act
TOD	Transit-Oriented Development
TriMet	Tri-County Metropolitan Transportation District of Oregon
TS&L	Type, Size, and Location
WBS	Work Breakdown Structure
VE	Value Engineering
VISSIM	Verkehr in Städten – Simulation, or “traffic in towns – simulation”
VISUM	Verkehr in Städten – Umlegung”, or “traffic in towns – assignment”
WSDOT	Washington State Department of Transportation

A. PROJECT PURPOSE

Work under Task AF will continue Phase 2 work elements as described in the Columbia River Crossing (CRC) Project Flow Chart. Phase 2 work began in Task AD and led to the publication of the Draft Environmental Impact Study (DEIS) and development of a draft Locally Preferred Alternative (LPA). Major work items in the continuation of this phase include obtaining an LPA, preparing and publishing the Final Environmental Impact Study (FEIS), obtaining Full Funding Grant Agreement from the Federal Transit Authority (FTA), obtaining a Record of Decision (ROD), continuing design work to support environmental and right of way efforts, and preparations for obtaining project funding.

Task AF services will cover the portion of Phase 2 work program occurring over a 16-month time period beginning September 1, 2008 and ending December 31, 2009.

Phase 2 work under Task AF will advance the project through the following key milestones:

- Oregon Interchange Access Management Plan (IAMP) adopted
- Interchange Justification Report (IJR) adopted
- Interchange Access Modification Request (IAMR) adopted
- Draft Washington Findings and Order produced
- Draft Oregon and Washington Right of Way plans produced
- Final Type Size and Location (TS&L) completed for the Columbia River Crossing bridge
- Partial Design Acceptance Package produced (Oregon)
- Partial Design Document produced (Washington)
- FEIS published
- ROD received

Key work elements include public involvement, development of funding strategies, transportation analysis, design and traffic engineering, and development of implementation strategies.

B. COORDINATION

This project is being jointly managed by the Oregon Department of Transportation (ODOT) and Washington State Department of Transportation (WSDOT) within the CRC Project Office. In this Statement of Work (SOW), CRC is defined as the Columbia River Crossing project. The STATE and STATES are defined as staff from either or both ODOT and WSDOT. The CONSULTANT is defined as David Evans and Associates, Inc. (DEA) and its subconsultants. Other agencies are described by name. The “CRC design team” or “CONSULTANT team”

includes DEA and its subconsultants while the “CRC team” includes the STATES and the CRC design team.

The original SOW was developed under the Managing Project Delivery process. Accordingly, the CRC and the CONSULTANT jointly developed a Vision and Purpose statement to guide the project development process:

Vision: The Columbia River Crossing project will improve the movement of people, goods, and services at the river crossing and within the corridor in a manner that is accepted and built. The project will be multimodal; environmentally sensitive; fundable; and support the community.

Purpose: Deliver the Environmental Impact Statement (EIS) and ROD; develop a framework and strategy to deliver the project; provide a roadmap for the next phase’s success; and, ultimately, build the project.

The CONSULTANT’s approach will be to perform as an adjunct of the STATES. The STATES will provide support services to the CONSULTANT as described in the SOW.

C. GENERAL ASSUMPTIONS

Work on this project is being conducted in a co-located office in Vancouver with STATES’ and CONSULTANTS’ staffs. Approximately 40 CONSULTANT team members will be occupying office space and assigned to the CRC office full time. Other CONSULTANT team members will be working off-site at their home offices. The CONSULTANT has relied on the identifying exclusions and assumptions within this Statement of Work in determining CONSULTANT’s effort, fee, scope and schedule for the Project. The STATE and CONSULTANT agree to renegotiate these terms in the event an assumption or exclusion becomes invalid. Notwithstanding any language to the contrary, the STATE and not the CONSULTANT is assuming all responsibility for the removal, transportation and disposal of any hazardous materials related to the Project.

Schedule

- Duration September 1, 2008 through December 31, 2009
- Assume 16 months for budgeting purposes (September 1, 2008 through December 31, 2009)
- Work approved by the STATES to continue under Task AD will be funded under Task AD until completed
- Submittal of FTA New Starts and PE application (September 2008)
- Publish FEIS (September 2009)
- ROD (February 2010)

Project Management

- 64 Project Development Team (PDT) and Mini- Project Development Team meetings
- Working Group meetings as needed and included in the budget

D. WORK ELEMENTS**1.0 PROJECT MANAGEMENT**

The purpose of this work element is to provide management and direction to the CONSULTANT and its subconsultants and provide support to STATES staff. The Project Management Plan (PMP) as developed and amended for the CRC project defines the roles, responsibilities, processes, and activities required for project delivery.

1.1 Project Team Oversight and Coordination

This work includes the internal day-to-day coordination and management of the CONSULTANT team. Work includes administrative support for assigning and scheduling work, monitoring progress, and managing change. This work element includes direction and monitoring of DEA's subconsultants and their work for delivery of Task AF.

Assumptions:

- Part of the CONSULTANT team will be co-located within the CRC project office with STATE's staff. The remainder will be located at their home offices. Expenses associated with team oversight and coordination will include project-related costs as approved by the STATES to provide management of the team.

1.2 Project and Agency Coordination Meetings

This work element provides for the preparation, attendance, participation, follow-up, and documentation of meetings with partner agencies and CRC project management in the day-to-day administration of the project. These meetings will be the forums for the STATES and partner agencies to provide input and guidance for the direction of the CONSULTANT and will be used to discuss submittals, identify project issues, and develop solutions. In addition, work under this element includes CONSULTANT management participation in working group meetings.

Assumptions:

- Regularly scheduled meetings with partner agencies and STATE and CONSULTANT Task Managers will be held at the CRC office in Vancouver, Washington. Working group, agency meetings, and meetings with Boards and Commissions may be held in various locations and will include travel time and expenses.

- This work element includes participation by the CONSULTANT Project Manager, Deputy Project Manager, and their designee(s). Other CONSULTANT Task Manager participation will be covered in other work elements within this SOW.

Deliverables:

- The CONSULTANT will provide agendas, action item tracking, and documentation of meetings for meetings that have been delegated to the CONSULTANT for meeting-management (AF1001)

1.3 Interdisciplinary Coordination and Documentation

This work element provides for coordination of work products, deliverables, and schedules among the various disciplines tasked with completing the FEIS and achieving a Record of Decision. Work includes developing strategies and gaining consensus on issues that arise that may impact budget and schedule. Decision documents and presentations will be prepared as necessary for communication with the STATES and committees.

Assumptions:

- Based on experience from Phase 2 work under Task AD, 500 hours are budgeted for this work element.
- The CONSULTANT will identify issues, recommend resolution processes, prepare agendas, document findings and prepare presentation materials with STATES and CONSULTANT Task Managers.

Deliverables

- CONSULTANT shall provide decision documents and presentations as required (AF1002)

2.0 PROJECT CONTROLS

The purpose of this work element is to develop and maintain the CRC Project Control Systems to support the CRC staff. The intent is to maintain a current schedule and budget scenario that matches the CRC scope and recommendations including supplemental task orders.

2.1 Project Controls Team Project Management

This work element includes management of the delivery of project controls tasks through quality control of products and processes, coordination and supervision of the project controls team, coordination with other project team members, and to provide support to other task managers on related work items.

Assumptions:

- The CONSULTANT will manage project controls in accordance with the approved Project Management Plan.
- This work element includes providing support for agency and public outreach activities through the preparation of financial and schedule related materials on an as needed basis.
- Duration September 1, 2008 through December 31, 2009
- CONSULTANT shall provide quality control of products, processes, and deliverables

Deliverables

- CONSULTANT shall provide financial and schedule related materials as required (Del# Assigned when identified)

2.2 Schedule Management and Control

This work includes the development, coordination, and management of the CRC Master Program Schedule. CONSULTANT work includes development of an overall Master Program Schedule including:

- Identifying activities of all stakeholders involved,
- Coordination of various disciplines within CRC,
- Incorporation of STATE interfaces,
- Coordination of milestones for internal and external agency coordination, and
- Identification and revision of key process milestones.

The CONSULTANT will maintain and update the Master Program Schedule on a monthly basis to reflect the current progress and status of individual activities and any revisions required to reflect the latest approved timeline and supporting activity coordination.

As various finance and funding models are formulated, the schedule will be modified as needed to reflect the work effort commensurate with the funding available.

Assumptions:

- Duration August 1, 2008 through December 31, 2009

Deliverables:

The CONSULTANT will maintain and/or provide:

- Task AF Baseline Schedule (AF2001)
- 16 monthly schedule updates in Critical Path Method (CPM) format with current progress/changes for each activity incorporated (AF2002)
- Concept Alternative Schedules (as necessary) (Del# Assigned when identified)

2.3 Budget Management

This work element provides for development, coordination, and management of the CRC Master Program Budget and document control. CONSULTANT work includes:

- Development of program budget
- Refinement and maintenance of a budget reporting system
- Coordination of project estimates
- Integration of ProLog and Project Schedule with Work Breakdown Structure (WBS) as agreed upon by Project Directors
- Identification/formalization of budget scope changes

Assumptions:

- Duration August 1, 2008 through December 31, 2009
- All project financial data to be reconciled to the agency General Ledgers on a monthly basis

Deliverables:

The CONSULTANT will provide:

- 16 monthly budget updates into ProLog (AF2003)

2.4 Document Control Management

This work element provides for capturing, indexing, securing, versioning, and keeping the project documents current, in order to maintain day-to-day access to project documents and their integrity. Major CONSULTANT tasks include:

- Technical report production and word processing
- Document scanning, processing and filing
- Version, Review and Status Tracking
- Transmittal Tracking
- Document Filing
- Monthly Deliverable & Schedule Meetings
- Public disclosure tracking

Assumptions:

- Review, document and track all FOIA public disclosure requests submitted to CONSULTANT are included
- Duration September 1, 2008 through December 31, 2009

Deliverables:

The CONSULTANT will provide:

- Monthly deliverable reports from ProLog (AF2004)
- Monthly FOIA reports from ProLog (AF2005)

2.5 Monthly Invoice and Progress Reports

This work element provides for the routine reporting to the STATES, and the Executive Management Group, of project progress and accomplishments. CONSULTANT work consists of:

- Update of report format/content as needed
- Compilation of progress data from CRC sources
- Generation of compiled report
- Distribution (as approved)
- Submittal and documentation of proposed changes in scope or work, including budget and schedule impacts as needed
- Contract amendment documentation for approved changes

Assumptions:

- Duration September 1, 2008 through December 31, 2009

Deliverables:

The CONSULTANT will provide:

- 16 monthly progress reports that include written progress updates on accomplishments and monthly cost and progress data (AF2006)
- 16 monthly invoices (AF2007)

2.6 Project Management Plan and Updates

This work element consists of the development and maintenance of the CRC Project Management Plan, as required by the FTA and FHWA. CONSULTANT work consists of:

- Content revisions to reflect the most current project direction
- Control of document distribution/updates

Assumptions:

- Duration September 1, 2008 through December 31, 2009

Deliverables:

The CONSULTANT will provide:

- 2008 - 2009 Draft and Final Project Management Plan Update (AF2008)

2.7 ProLog Database Management Support

This work element consists of supporting the WSDOT IT department for the deployment and ongoing usage of the ProLog project management database system. CONSULTANT work consists of:

- Updating user passwords and security
- Clean up of identified erroneous data requiring administrative intervention
- Providing custom reports for major team efforts
- Providing minor day-to-day user support
- Establishing and implementing ongoing user training

Assumptions:

- Duration September 1, 2008 through December 31, 2009.
- WSDOT IT department responsible for all IT connectivity, server, product updates, upgrades and implementation of new software.

Deliverables:

The CONSULTANT will provide:

- Upkeep of ProLog User's manual chapters (AF2009)

3.0 FINANCIAL STRUCTURES

The purpose of this work element is to advance the development of (a) coordinated financial plans for the highway and transit components of the CRC project and (b) institutional arrangements required for the CRC Project. This scope of work covers the 16-month period between September 1, 2008 and December 31, 2009. The CONSULTANT will provide technical support and intergovernmental coordination services toward achieving these objectives.

3.1 Financial Team Project Management and Quality Control

The CONSULTANT will manage the financial and institutional structures team, organize and administer work group meetings, coordinate with CRC CONSULTANT project managers, and collaborate with and provide support to other task managers on related work items. Work under this task includes quality control for all deliverables. Major work elements include the following:

- Participation in bi-weekly Task Manager meetings (maximum of 32)
- Participation in weekly or other recurring meetings with the project co-directors (maximum of 65)

- Participate in bi-weekly SASS meetings (maximum of 32)
- Attend other special meetings as needed (maximum of 16)
- Preparation of monthly progress reports (maximum of 16)
- Ongoing task management, financial coordination meetings, other subconsultant administration, and general administrative duties limited by the hours in approved budget for this task
- CONSULTANT will attend monthly deliverables/document control meeting
- CONSULTANT will provide quality control by senior financial consultants for all Financial Structures deliverables

Deliverables:

The CONSULTANT will provide:

- Memoranda, materials and/or meeting minutes associated with special meetings and financial team coordination

3.2 Agency and Public Outreach Support

The CONSULTANT will provide support to outreach efforts and attend agency and stakeholder meetings as required for financial, funding, and tolling issues for up to 16 agency and stakeholder meetings. The CONSULTANT will provide support to public outreach efforts as required for financial, funding, and tolling issues for up to eight public meetings.

Deliverables:

The CONSULTANT will provide:

- Contributing materials regarding institutional, funding, and tolling issues, to be determined during the course of work

3.3 Tolling Analysis

The CONSULTANT will upgrade toll forecasting methodology and apply it to toll structure scenarios to determine optimal toll structure to use for next phase of project development studies. Major tasks include:

3.3.1 Upgrade Tolling Methodology to Increase Accuracy and Reduce Variability on Toll Revenue Forecasts

- Undertake Field Surveys of Purpose and Frequency, including surveys on origin and destination. The primary focus of this effort is to determine the underlying purpose and frequency of trips for CRC users as well as refinements to volume and diversion data. The surveys will provide the necessary data so CONSULTANT can estimate the types of All-ETC systems and supporting customer service facilities needed; in addition, the data supports the Tolling and Revenue estimates. CONSULTANT will oversee the work of a sub-consultant in doing the video camera work and follow-up coding of data.

- Undertake Stated Preference Surveys. These are surveys to estimate the relative value of tolls versus travel time savings, typically by purpose. In an area where there are no toll roads, it provides much comfort to the investment community, and supports any modeling efforts.
- Refine Toll Component of Traffic Modeling. The regional model did not attempt to provide a toll diversion algorithm, but simply coded tolls as a fixed cost in the model. Undertake preliminary work to determine if we can use the regional model and incorporate toll diversion algorithms, or if we have to proceed to an alternative course for work leading eventually to an Investment Grade study. In addition, determine modeling procedures to better estimate traffic/toll revenues by time of day (in off-peak), mode (truck types), and weekends.

3.3.2 Refine Toll Financial Capacity Model

- Refine highway operations and maintenance assumptions, pay-by-plate assumptions, transaction costs, etc. based on results from Tacoma Narrows Bridge and other comparable operating toll facilities nationwide obtained..

3.3.3 Preparation of Updated and Refined Toll Financial Capacity Analysis and Toll Optimization Analysis

- Perform a comprehensive tolled facility cash flow forecast with refined assumptions and more robust forecasts than used in Task AD for the major drivers: pricing/demand, capital expenditures, operating expenditures, and rehabilitation/replacement costs.
- Test alternative toll rate structures to determine optimal structure for use in FEIS and state legislative efforts.

Deliverables:

The CONSULTANT will provide:

- Report on methodology and results of Field Surveys of Purpose and Frequency and origin and destination data (AF3001)
- Report on methodology and results of Stated Preference Survey, including value of time savings (AF3002)
- Memorandum describing revised tolling model for application with Metro models and, if required, micro-assignment model; memorandum must provide complete documentation on resulting toll model. (AF3003)
- Memorandum describing alternative toll rate structures to be analyzed in toll optimization study. (AF3004)
- Memorandum describing refined financial capacity analysis assumptions to be used in toll optimization and financial capacity study. (AF3005)
- Memorandum describing refined toll collection costs, back-of-house costs, and other operations and maintenance cost assumptions (AF3006)

- Report on financial capacity and toll rate structure optimization analysis including toll elasticity curve and toll sensitivity analysis (AF3007)

3.4 Refined Analyses of Financial Plan Issues

The CONSULTANT will provide a refined finance plan prepared on a cash-flow basis and based on updated assumptions regarding costs, schedule, revised toll estimates, etc. The CONSULTANT will also prepare necessary materials to seek federal, state and regional funding contributions for the transit and highway components of the project, including preparation of the FEIS and other federal requirements. Major tasks include:

3.4.1 Analyze Cash-Flow Funding Issues

- Work with STATES Engineering Team to establish project development schedule options to examine financial implications
- Prepare funding plans to match project development schedule options
- Prepare funding demand schedule to match project development schedule options
- Assess interim borrowing requirements and methods for addressing requirements
- Evaluate financial consequences of project development schedule
- Evaluate and recommend uses of Transportation Infrastructure Finance and Innovation Act (TIFIA)

3.4.2 Address Concepts That Come Out of Public-Private Partnership (PPP) Analysis

- Refine finance plan based on updated results on project delivery methods
- CONSULTANT will work with the PPP offices of the respective DOTs to address the financial plan impacts of PPP opportunities identified by the PPP offices for the project.

3.4.3 Resolve Outstanding Funding Plan Issues

- Refine how transit option works with the highway option from a financial perspective
- Identify cost overrun plan generally required by FTA
- Identify bonding relationships between the states and work with the financial advisors of the states to evaluate potential debt capacity for alternative debt strategies including separate issuance, joint authority, government sponsored third party issuer or other
- Develop and recommend strategies to mitigate financing costs

3.4.4 Financial/Funding Risk Analysis

Provide Financial/Funding Risk Analysis to address the risks associated with funding sources and a strategy to managing risks and mitigating revenue shortfalls. .

3.4.5 State Funding Plan

- Prepare forecasts for state funding sources

- Prepare document describing finance plan and estimates of amounts and timing of needed state contributions and uses of the funds not later than December 31, 2008

3.4.6 Assist in Acquiring State Funding

- Prepare or assist in preparing legislation to help STATE in securing state funding in Washington
- Provide project information, fact sheets, and responses to questions from Oregon staff as needed to assist ODOT in securing Oregon state funding
- Prepare or assist in preparing bond authorization legislation in Washington
- Provide project information, fact sheets and responses to questions from Oregon staff as needed to assist ODOT in securing bonding authorization
- Prepare facts sheets and responses to questions from Oregon or Washington legislators as needed.
- Attend hearings and provide testimony as may be required

3.4.7 Assist with Implementation of HCT Act Requirements

- Prepare Agreement on C-TRAN and TriMet Operations and Maintenance funding related to CRC
- Prepare or assist in preparing required analyses and documentation required by HCT Act
- Assist in preparation of systems plan
- Work with Regional Policy Committee
- Work with Expert Review
- Prepare responses to questions arising from HCT Systems Plan.

3.4.8 Funding Plan for New Starts Submittal

A portion of the New Starts submittal may be prepared under Task AD. Under this Task AF, the CONSULTANT will prepare the financial-related components of New Starts submittal not completed during Task AD. Major tasks include:

- Prepare Capital and Operations Finance Plan Report for New Starts Submittal for PE
- Prepare financial templates for PE
- Prepare Capital and Operations Finance Plan Report for New Starts Submittal for Final Design
- Prepare financial templates for Final Design
- Coordinate with FTA on finance plan issues

3.4.9 Prepare Grant Applications for Federal Discretionary Funding

- As needed, assist DOTs in preparing application materials for federal discretionary grant opportunities.
- If needed, assist DOTs in preparing application for TIFIA assistance.

3.4.10 Financial Plan for Major Project Requirements

- Prepare, as required, necessary funding plans to comply with FHWA requirements for Major Projects.
- Meet with federal officials, as may be required, to obtain necessary approvals.

3.4.11 Facilitate Federal Legislation

- Assist in preparing bill and report language related to reauthorization and federal discretionary bills.
- Provide responses to questions raised in connection with federal legislative requests.
- Consultant shall provide a timely response to address questions raised in connection with federal legislative requests in accordance with a schedule agreed-upon by Project Directors and Consultant.

3.4.12 Final Environmental Impact Statement

The CONSULTANT will prepare financial plan materials for the FEIS. Major tasks include:

- Prepare draft Chapter 4, Financial Plan for FEIS
- Meet with CRC Project Staff and federal reviewers as necessary
- Prepare final Chapter 4 for FEIS

Deliverables:

The CONSULTANT will provide:

- Memorandum on Refined Cash-Flow Financial Plan (AF3008)
- Memorandum on Funding Risk Analysis (AF3009)
- Memorandum on funding demand schedule based on project development schedule options. (AF3010)
- Intermediate memoranda to the Columbia River Crossing Executive Management Group providing supporting data and project detail to support policy decisions (AF3011)
- State Funding Plan document not later than December 31, 2008 (AF3012)
- Washington State legislation, as required (AF3013)
- Fact sheets and responses to questions from Oregon staff and Oregon legislators as required and within budget. Responses to questions shall be provided in accordance

with a schedule agreed-upon by the ODOT CRC Project Director and CONSULTANT. (AF3014)

- Memoranda in support of HCT Systems Plan preparation and review (AF3015)
- New Starts submittal materials for PE and Final Design (AF3016)
- Updated financial plan to STATES for federal funding request not later than December 31, 2008 (AF3017)
- Major Projects Finance Plan (AF3018)
- Draft legislation and supporting memoranda required to seek federal funds as requested by STATES (AF3019)
- Application materials for competitive federal discretionary grants, as required (AF3020)
- Timely responses to questions raised in connection with federal legislative requests (AF3021)
- Chapter 4, Financial Plan for FEIS (AF3022)

3.5 Resolve Institutional, Intergovernmental, and Administrative/Regulatory/Statutory Issues Affecting the Financing of the CRC Project

Underlying the finance plan for the CRC project will be an array of agreements and arrangements between the States, the States and the Federal government, the States and local governments, the States and the transit sponsors, and between the transit sponsors. Establishing and/or implementing these agreements or arrangements may require regulatory or statutory analyses or amendments. The CONSULTANT will provide support during negotiations between the interested parties and draft agreements or memoranda documenting status of agreements and issues. The CONSULTANT will:

- Provide support during negotiations and provide draft agreement between TriMet and C-TRAN on operations issues and cost sharing
- Provide support during negotiations and provide draft agreement between WSDOT and ODOT on cost sharing, bonding responsibilities, etc.
- Provide support during negotiations and provide draft agreements between DOTs, transit operators, and cities on project responsibilities, including cost overrun issues and financial commitments.

Assumptions:

- The STATES and other parties to the draft agreements are responsible to provide their own legal review and approvals and make changes as necessary to the agreements.

Deliverables:

The CONSULTANT will provide:

- Memorandum documenting areas of agreement and areas needing future agreement between the transit sponsors/operators regarding funding and operations responsibilities. (AF3023)
- Provide draft formal agreements between transit operators. (AF3024)
- Memorandum documenting areas of agreement and areas needing future agreement between the DOTs on funding and bonding responsibilities. (AF3025)
- Provide draft formal agreements between DOTs . (AF3026)
- Provide draft formal agreements between DOTs, transit operators, and cities on financial and project development responsibilities. (AF3027)

4.0 COMMUNICATIONS

The purpose of this work element is to provide timely and accurate information to stakeholders and the general public in Oregon and Washington to engage their interest, enhance their understanding and gain their support for the project.

Overall Working Assumptions:

- The CRC communications team is a blended team of STATE, Transit and CONSULTANT staff working together under the direction of the Project Directors to fulfill the mission and objectives of the project.
- Four full-time STATE employees will include communications manager and outreach and graphic design staff. The STATE will lead/manage communications efforts with support from CONSULTANT staff.
- CONSULTANT will provide a communications lead to oversee CONSULTANT contract and manage CONSULTANT communication staff.
- STATE will provide final approval of all materials produced, including external documents and internal plans, strategies and talking points.
- CONSULTANT will provide media relations support, while the STATE staff will represent the project in interviews with the media.
- Communications and outreach efforts for this period will be directed to communities adjacent to the project area as well as efforts to reach a broader geographic area in both states.
- The number of CONSULTANT staff available for Task AF has been designated by the STATE along with available hours. The STATE will determine which tasks below (but only to the extent of the approved budget for the CONSULTANT) will be completed by CONSULTANT staff and which will be the responsibility of STATE or sponsor agency staff.

4.1 Communications Management

This work element is to develop and implement a coordinated communications strategy for the project, which will be documented in the project's Communication Plan. The Communications Plan for this phase of work will build off of the previous plan.

This task also includes day to day management; strategic support; administrative and procedural requirements for the preparation of monthly billing summaries; task and budget tracking and oversight; document control; and quality control of project materials and outreach plans.

Assumptions:

- The CONSULTANT will provide strategic support to the CRC project and STATE leadership.
- CONSULTANT will follow project protocols for document control and deliverable tracking.
- CONSULTANT will attend monthly deliverables/document control meeting.
- CONSULTANT will submit monthly communications report for the monthly consultant progress report.
- CONSULTANT will submit monthly billing summary and invoice, tracking activities and budget at the task level.

Deliverables:

- Updated communications plan (up to three revisions) (AF4001)

4.2 Group Support and Project Meetings

This work element is to help ensure that the Communications Team is working closely with other team members to gain day to day project information, to share communications strategies and materials, and to closely coordinate overall project direction and details. Communication Team roles relating to internal coordination, advisory group meetings and project meetings are described below.

Group Support

The Communications team will coordinate, facilitate, staff and/or support the project's advisory groups. The 39-member Task Force will not be meeting during this scope of work.

4.2.1 Urban Design Advisory Group

The Urban Design Advisory Group (UDAG) will continue to meet during this scope of work.

Assumptions:

- The STATE will provide leadership and participation for UDAG.

- The CONSULTANT will support meeting facilitation and between meeting coordination.
- The CONSULTANT will be responsible for all logistics, meeting materials, venue rentals and catering orders, per the approval of the STATE; two CONSULTANT staff will attend each meeting.
- The CONSULTANT will submit meeting dates and meeting materials to the STATE to post on the web site.
- The STATE is responsible for all direct costs associated with the meetings but CONSULTANT will accept the invoicing and process payment as a direct expense under CONSULTANT's contract.

Deliverables:

The CONSULTANT will provide:

- Agendas, summaries and materials for each meeting (up to 8) (AF4002)
- Monthly UDAG web site updates (up to 8) (AF4003)

4.2.2 Pedestrian and Bicycle Advisory Committee

The Pedestrian and Bicycle Advisory Committee (PBAC) will continue to meet regularly during this scope of work.

Assumptions:

- The STATE will provide leadership and participation for PBAC.
- The Traffic Team will support meeting facilitation and between meeting coordination.
- The CONSULTANT will attend meetings, provide communications updates, and support the STATE and the Traffic Team as requested within hours budgeted.
- Meetings will take place at the project office; no venue costs required.
- The CONSULTANT will coordinate with the Traffic Team to submit meeting dates and meeting materials to the STATE to post on the web site.

Deliverables:

The CONSULTANT will coordinate with the Traffic Team to provide:

- Agendas, summaries and materials for each meeting (up to 8) (AF4004)
- Monthly PBAC web site updates for the STATE to post (up to 8) (AF4005)

4.2.3 Community and Environmental Justice Group

The Community and Environmental Justice Group (CEJG) will continue to meet monthly during this scope of work.

Assumptions:

- The STATE will provide leadership and participation for CEJG; meeting facilitation and between meeting coordination will be the responsibility of the STATE.
- CONSULTANT will be responsible for all logistics, venue rentals and catering orders.
- The STATE will determine and finalize all meeting materials prior to distribution or web posting.
- The STATE will post meeting dates and meeting materials to the web site. CONSULTANT will provide support within hours budgeted.
- The STATE is responsible for all direct costs associated with the meetings but CONSULTANT will accept the invoicing and process payment as a direct expense under CONSULTANT's contract.

Deliverables:

The STATE will provide:

- Agendas, summaries and materials for each meeting (up to 16) (AF4006)
- Monthly CEJG web site updates (up to 16) (AF4007)

4.2.4 Freight Working Group

The Freight Working Group (FWG) will continue to meet regularly during this scope of work.

Assumptions:

- The STATE will provide leadership and participation for FWG.
- The Traffic Team will support meeting facilitation and between meeting coordination.
- The CONSULTANT will attend meetings, provide communications updates, and support the STATE and the Traffic Team as requested, within hours budgeted.
- Meetings will take place at the project office; no venue costs required.
- The CONSULTANT will coordinate with the Traffic Team to submit meeting dates and meeting materials to the STATE to post on the web site.

Deliverables:

The CONSULTANT will coordinate with the Traffic Team to provide:

- Monthly FWG web site updates for the STATE to post (up to 16) (AF4008)

4.2.5 Project Sponsors Council

The Project Sponsors Council (Council) will meet approximately monthly during this scope of work. The first meeting will be a kick-off meeting. Meetings will be open to the public and media coverage is expected.

Assumptions:

- The STATE will provide leadership and participation for this new advisory group.
- The CONSULTANT will support meeting facilitation and between meeting coordination.
- The CONSULTANT will prepare meeting materials, including talking points, PowerPoint presentations, handouts, and written summaries.
- The CONSULTANT will coordinate up to two prep meetings with the STATE prior to each Council meeting.
- The CONSULTANT will draft a press release prior to each meeting. If needed a meeting-specific media plan will also be developed.
- The CONSULTANT will be responsible for all logistics, venue rentals and catering orders, per the approval of the STATE; multiple CONSULTANT staff will attend each meeting.
- The CONSULTANT will coordinate with WSDOT IT as necessary for meeting technical support.
- The CONSULTANT will submit meeting dates and meeting materials to the STATE to post on the web site.
- The STATE is responsible for all direct costs associated with the meetings but CONSULTANT will accept the invoicing and process payment as a direct expense under CONSULTANT's contract.

Deliverables:

The CONSULTANT will provide:

- Agendas, summaries and materials for each meeting (up to 12) (AF4009)
- Monthly web site updates (AF4010)
- Final press releases for each meeting (up to 12) (AF4011)
- Email to members prior to each meeting (up to 12) (AF4012)

4.2.6 Project Meetings

Up to two Communications Team members will participate in the following project meetings: PDT, Mini-PDT, Task Managers, Project Management, Sponsor Agency Senior Staff (SASS), and other meetings as required.

Assumptions:

Regular verbal update on project communications at each meeting below:

- Bi-weekly Task Managers meetings
- Weekly Project Management meetings

- Bi-weekly mini-PDT
- Bi-weekly SASS
- InterCEP (up to four)
- Others, TBD

Deliverables:

- Documents to support the meetings above, as needed (AF4013)

4.2.7 Discipline Area Coordination

The Communications Team will continue to meet weekly. The CONSULTANT team will schedule additional planning meetings as needed in order to produce work products according to the established schedule.

Interaction will Finance, Environmental, Traffic, Transit, and Design teams will continue during this scope of work.

Assumptions:

CONSULTANT involvement will include:

- Weekly Communications Team meeting
- Weekly Communications Manager/CONSULTANT Communications Lead meeting
- Weekly CONSULTANT Lead/ CONSULTANT Communications Lead meeting
- Planning and coordination meetings with the CONSULTANT Finance team regarding tolling and funding issues (up to 6).
- Coordination meetings or attendance at regularly scheduled Traffic team meetings (up to 12).

STATE involvement will include:

- Coordination meetings or attendance at regularly scheduled Environmental and Engineering team meetings (up to 12 per discipline, or 24 total)

TRANSIT involvement will include:

- Weekly Transit team meetings

4.2.8 Key Stakeholder Support

The CONSULTANT will provide communication with key stakeholders and groups to facilitate their understanding of project issues, solicit their input on project direction, obtain feedback on project progress and identify opportunities for effective participation with the approval of STATE. When appropriate, the CONSULTANT will coordinate activities through STATE staff outside of the project office.

The CONSULTANT will attend up to 12 meetings that CRC is not presenting at in order to observe and report back to the STATE. The CONSULTANT will attend meetings as directed by STATE, which may include the Joint Policy Advisory Committee on Transportation (JPACT), Vancouver City Council, Portland City Council, C-TRAN Board, Metro Council, Regional Transportation Council (RTC), Oregon and Washington legislative meetings, and others as identified.

Assumptions:

- A maximum of 5 hours per week will be spent on these activities.

Deliverables

- Meeting summaries for meetings that CONSULTANT attends without presenting (up to 12) (AF4014)

4.3 Materials

The purpose of this work element is to ensure that information is created and disseminated to a broad range of audiences in order to promote awareness, understanding, and support for the project. Materials will follow approved project standards and be written in a style appropriate for general audiences. Visuals will be used as often as practical to convey the intended information. Translations will be made of materials as appropriate at key project milestones. Distribution of materials is included in the Work Element 4.5 Public Outreach and Engagement.

Assumptions:

- The previously high quantity of materials in Task AD will continue during this task, to support the EIS and design processes.
- Translation coordination (up to three languages) for web and printed materials will be the responsibility of the STATE; invoices for these services will be processed by the CONSULTANT.
- CONSULTANT will review materials produced by other disciplines that are intended for public discussion, including technical memos, reports and chapters of the Final EIS.
- CONSULTANT will monitor web site, draft updates, QC new content, and QA final copy prior to posting; STATE will be responsible for implementing web updates and coordinating with WSDOT IT.
- Web site will be monitored at least weekly by CONSULTANT for updates.
- The CONSULTANT team will continue to produce final product or final text for fact sheets, display boards, mailers, newsletter inserts, newsletters, monthly email project updates, display ads, presentation materials, etc., unless designated to be done by the STATE. All materials will be reviewed and approved by the STATE.
- The STATE will be responsible for graphic layout of materials and for revisions to existing images and maps.

- The CONSULTANT will be responsible for producing new text, unless designated to be done by the STATE, and presentation concepts and updating existing information/text as needed:
 - Fact sheets (up to 15 new fact sheets, up to 5 updates to new and existing fact sheets)
 - Folios (up to 4 new folios)
 - Mailers, including postcards and newsletters (up to 4); the STATE will be responsible for layout and coordinating printing and mailing with external vendors.
 - Display boards for open houses, briefings and other public events (up to 250)
 - Display ads (up to 4 sets in up to 10 papers)
 - Event fliers/posters (up to 10)
 - Multi-panel traveling display (up to 4 updates to each panel)
- The CONSULTANT will produce and distribute the project's email update (monthly)
- The CONSULTANT will develop PowerPoint presentations in coordination with technical staff and project management. Presentations will be approved by the STATE (up to 75)

Deliverables:

Final copies of the following materials:

- Fact sheets (up to 15 new fact sheets) (AF4015)
- Folios (up to 4 new folios) (AF4015)
- Translated materials (folios, newsletter, display ads, up to four languages) (AF4016)
- Project E-update (up to 16) (AF4017)
- Mailers, including postcards and newsletters (up to 4) (AF4018)
- Display boards (up to 150) (AF4019)
- Display ads (up to 4 sets in up to 10 papers) (AF4020)
- Traveling display (AF4021)
- Event posters (AF4022)

4.4 Tracking and Response

The purpose of this work element is to ensure consistent, timely and transparent communication between the public and the project, and to monitor, compile and summarize content for the project. The CONSULTANT will manage and maintain a system to track contacts and comments, synthesize key themes, identify differences between key themes in Oregon and key themes in Washington, and report the information for the consideration of the STATE, advisory groups, and sponsor agencies. The CONSULTANT will coordinate with the environmental team to also prepare comment forms for key events and open houses, compile and analyze responses, and prepare summary reports. The STATE will review and finalize comment forms and reports.

Assumptions:

- CONSULTANT will manage and update the project mailing list and email update subscriber list on an ongoing basis.
- The CONSULTANT will process and track public comments and responses on an ongoing basis.
- The CONSULTANT will draft responses to public correspondence (up to 400), by mail and email. Draft responses will be reviewed by the environmental team. The STATE will finalize and approve responses before they are sent. STATE standards include a target response turnaround time of 5 - 7 business days.
- The STATE will be responsible for tracking and responding to public information/FOIA requests. CONSULTANT will support within allotted budget.
- The CONSULTANT will coordinate with the Environmental Team to ensure the accuracy of monthly and quarterly comment summaries.
- Monthly comment summaries will be incorporated into the monthly Communications and Outreach summary.
- The CONSULTANT will support the Draft EIS comment response process and will draft responses to public involvement questions/comments on Draft EIS as requested by the Environmental Team. Responses will be approved by the STATE.
- The CONSULTANT will produce a monthly Communications Summary of public involvement activities, including outreach events, comments received, media coverage and upcoming events. The STATE will approve the summary before it is distributed internally, to STATE staff, and to project sponsors.
- CONSULTANT will draft responses to public correspondence regarding the Project that was addressed to Governors of Oregon and Washington. The STATE will finalize and approve responses before they are forwarded to the governor's staff. Standards will include a target response turnaround time of 3-5 business days. The STATE is responsible for communication with Governor's office and tracking.

Deliverables:

- Final responses to public questions submitted via email, mail, fax, phone or in-person. This does not include comments received during the Draft EIS comment period.(up to 400) (AF4023)
- Open house/public event comment forms (up to four) (AF4024)
- Comment summary reports from open houses and drop-in events (up to eight) (AF4025)
- Monthly Communications summaries (up to 16) (AF4026)

4.5 Outreach and Engagement

The Communications Team will continue to initiate activities for meeting with people in the project area and in the counties surrounding the project area. STATE and CONSULTANT staff

will participate in outreach events and present information to the public. A variety of activities will be planned in order to reach an array of people with a variety of methods, including briefings, fairs/festivals, open houses, constituent meetings, and others. The CONSULTANT will maintain and update a calendar of outreach activities at least weekly. Outreach activities will be summarized monthly for the Communications Summary (tracked as a deliverable for Work Element 4.4).

Assumptions:

- Project information will be provided to the public at fairs and festivals, primarily during summer months (up to 60, over two summers). Events will be staffed by STATE and CONSULTANT team members. In addition, the CONSULTANT will:
 - Schedule events and coordinate logistics
 - Prepare materials and talking points
 - Prepare event summaries
- Open houses (sets up to four) and drop-in events (up to four) will be held at key project milestones and to provide comprehensive updates to the public. The first set of open houses will be held after the release of the LPA. The second set of open houses would correspond with the FEIS and/or ROD. Drop-in events will be scheduled at other significant project milestones. These multi-hour events will be staffed by STATE and CONSULTANT staff. The STATE will be responsible for graphic production of materials, including boards, fact sheets, display ads, mailers, etc, and will post all materials to the web site the day after the first open house or drop-in event. The CONSULTANT will:
 - Schedule events and coordinate logistics, include venue rental and compliance with the Americans with Disabilities Act
 - Prepare materials production schedule, draft fact sheets, folios, display boards, comment forms and others as needed. The STATE would approve all materials.
 - Prepare talking points for staff and coordinate internal prep sessions (up to 2 per event)
 - Coordinate with other discipline teams to prepare materials and confirm staffing
 - Prepare event summaries
- One open house will precede a Limited Access Hearing in later 2008 or early 2009. The CONSULTANT will coordinate with STATE and the Design and Engineering teams to plan this formal hearing. Notification, materials and the actual hearing will follow guidelines in the Washington Design Manual. CONSULTANT will coordinate logistics, including venue rental and securing a court reporter and hearing examiner.
- The CONSULTANT will continue to schedule and coordinate community and business briefings (up to 160). This includes preparing materials, coordination with the requesting organization and preparing talking points.

- CONSULTANT and STATE will staff community briefings. The presenter will prepare a meeting summary.
- TRANSIT will staff briefings focused on transit-related issues.
- Community briefings include presentations to social service organizations, low-income housing centers, senior services, and organizations serving minorities and limited English speakers
- The STATE, TRANSIT and CONSULTANT will support project briefings with agency boards, city councils and STATE legislators/committees (up to 50). The CONSULTANT will:
 - Coordinate logistics
 - Prepare materials and talking points
 - Coordinate internal prep sessions
 - Staff events as requested and prepare summary
- Transit outreach with neighborhood associations, business owners and residents in Vancouver and Hayden Island is expected to increase during this scope of work. TRANSIT will coordinate:
 - Light rail discussions/workshops/tours (up to 5)
 - Design and station location workshops (up to 10)
 - Alignment workshops (up to 8)
- The STATE will facilitate right of way meetings with property owners (up to 4 larger group meetings, individual meetings as requested). The CONSULTANT will coordinate logistics as needed within the budget allotted.
- The CONSULTANT will be responsible for scheduling locations for a static traveling display (up to 30 locations, 15 in each STATE).
- The CONSULTANT will be responsible for coordinating with a sub-CONSULTANT to conduct focus groups/surveys on issues such as tolling (up to 6)
 - The CONSULTANT will develop a proposal and strategy for STATE approval.
 - Approach and timing will be coordinated with STATE projects and objectives.
- Issue-specific outreach strategies will be developed and implemented, in coordination with the Environmental Team, for the following:
 - Mitigation discussions/workshops with neighborhoods (up to 16)
 - Sustainability plan
 - Cultural/natural history workshops or design charrettes (in partnership with National Historic Reserve, National Park Service; up to 2)
 - Low income, disabled and/or other specific communities

- CONSULTANT will coordinate logistics, including: materials, speakers, advertising and venues.
- The CONSULTANT will develop a Final EIS notification and outreach plan for implementation by the Communications Team.
- The CONSULTANT will coordinate and support document distribution (with Environmental team)

Deliverables

- Event plans/strategies/summaries for open houses, drop in events, transit workshops, ROW meetings, and others (AF4027)
- Community and business meetings/briefings summaries and materials (agendas, etc) (AF4028)
- Focus group survey results and summary (AF4029)
- PowerPoints, display boards and other materials referenced in this work element are counted as deliverables in 4.3 Materials. (AF4030)

4.6 Media

The CONSULTANT will be responsible for supporting print and visual media coverage and interaction. The CONSULTANT will also track and compile media coverage received by the project. Increasing media coverage is expected as the project moves closer to the Final EIS, the Record of Decision, and ultimately construction.

The STATE will provide direction for proactive media strategy. The CONSULTANT will draft and finalize the media plan for this phase of work with the STATE.

Assumptions:

- The CONSULTANT will provide background support and the STATE will serve as the “face” of the project.
- The CONSULTANT will draft and update media plans and media protocols as requested by the STATE.
- Up to 5 event specific media plans will be developed by the CONSULTANT, following the guidance of the overall project media plan
- The CONSULTANT will support the STATE in the coordination of editorial board briefings and reporter briefings as needed.
- The CONSULTANT will maintain and update the media list for the project.
- The STATE will complete and distribute a media inquiry report for each media contact, with support from the CONSULTANT if needed.
- Media coverage will be summarized by CONSULTANT on a monthly basis in the Communications and Outreach summary.

- The CONSULTANT will provide final press releases to the STATE for posting on the web site.
- The CONSULTANT will distribute press releases to the project's media list.
- The CONSULTANT will maintain and update a binder of media coverage.

Deliverables:

- One draft and one final media plan for the project (AF4031)
- Event specific media plans to support the LPA selection, Final EIS, ROD, CEVP, and others still to be determined (up to 6) (AF4032)
- Press releases (up to 12, does not include press releases described in Work Element 4.2 Group Support) (AF4033)
- Editorial board briefings with Columbian, Oregonian, Portland Tribune, Skanner, El Hispanic News, and others as determined by the STATE (up to two briefings per paper) (AF4034)
- Media inquiry reports to record media inquiries and media briefings (up to 75 media inquiry reports and up to 10 briefings) (AF4035)
- Monthly PDF file of daily media coverage for project records and reference (AF4036)

4.7 Market Research

The purpose of this work element is to supplement public outreach with market research that allows the project to achieve several goals. First, to test awareness levels about the project beyond the people we are already reaching; second, to learn which issues the team needs to emphasize in broader contexts; and third, it allows the team to gain quantitative information about public perceptions on the project.

The CRC project will continue to seek public input through market research to add quantitative support and information regarding to the anecdotal information collected through the grass roots outreach efforts.

Deliverables:

The CONSULTANT will provide:

- Focus Groups (AF4037)
 - Draft and final discussion guides for the focus groups
 - Draft and final summaries of focus groups and findings
 - Two random sample, scientifically quantifiable surveys with comprehensive report on top line and cross tab results, relating to tolling issues and the LPA
 - Draft and final questions for each survey conducted
 - Hard copy of survey results showing top line and cross tab results

- Summary of each survey of key findings
- Two series of focus groups in Portland and Clark County; relating to tolling (AF4038) and the LPA (AF4039)

5.0 TRANSPORTATION PLANNING

The purpose of this work element is to provide multimodal transportation planning and traffic engineering support to the CRC project team. Major elements of this work element include design support, travel demand forecasting and traffic operations analysis to support the project and for the LPA, and to develop technical studies to support the FEIS.

To accomplish these tasks, the transportation planning and traffic engineering work element is broken down into 16 subtasks, which are listed below. Significant assumptions and deliverables are listed under each subtask. The work will focus on one 2035 Build alternative, the LPA.

5.1 Transportation Team Project Management and Quality Control

The CONSULTANT will manage all individual tasks related to transportation planning and traffic engineering, participate and collaborate with other task managers on related work items, and oversee progress reporting. Monthly progress reports will be developed and the CONSULTANT will attend project development team meetings. The CONSULTANT will adhere to the CRC quality plan. Activities under this subtask include:

- Task implementation
- Monthly progress reports (16)
- Attend PDT meetings (64)
- Attend special meetings as needed (48)
- Quality control plan update (as needed) and implementation
- Bi-weekly coordination meetings with the highway and transit teams

Assumptions:

- The CONSULTANT will attend a bi-weekly PDT meeting through the end of the FEIS.
- The CONSULTANT will attend special meetings with Federal, City, County, FHWA, FTA, and other officials or consultants as directed by the STATE.
- The CONSULTANT will attend monthly deliverables/document control meeting.

5.2 Agency and Public Outreach Support

The CONSULTANT will support the agency and public outreach efforts undertaken by the CRC project team throughout the duration of Task AF. Support efforts will include attendance at and preparation for meetings.

Assumptions:

- Attendance at up to 36 agency and public outreach meetings.
- Input to meeting summaries for the agency and public outreach meetings.

Deliverables:

The CONSULTANT will provide:

- Up to eight PowerPoint presentations for agency and public outreach meetings. (AF5001)

5.3 Facilitation of Freight Working Group

The CONSULTANT will facilitate Freight Working Group meetings as a part of this work element. The CONSULTANT will organize and provide materials for all Freight Working Group meetings and will issue meeting summaries.

Assumptions:

- Facilitation of up to 8 Freight Working Group meetings.

Deliverables:

- Meeting Agendas and Summaries for Freight Working Group meetings . (AF5002)

5.4 Facilitation of Pedestrian and Bicycle Advisory Committee

The CONSULTANT will facilitate Pedestrian and Bicycle Advisory Committee meetings as a part of this work element. The CONSULTANT will organize and provide materials for all Pedestrian and Bicycle Advisory Committee meetings and will issue meeting summaries. The CONSULTANT will work with the advisory committee to review pedestrian and bicycle forecasts, bridge trail needs and designs, and connection needs and designs. In addition, the CONSULTANT will facilitate the advisory committee's work related to pedestrian and bicycle issues at proposed reconfigured interchanges and intersections, as well as at proposed transit stations.

Assumptions:

- Facilitation of up to 12 Pedestrian and Bicycle Advisory Committee meetings.

Deliverables:

- Meeting Agendas and Summaries for Pedestrian and Bicycle Advisory Committee meetings . (AF5003)

5.5 Year 2035 Traffic Forecasts and Traffic Analysis

... Metro/RTC will conduct year 2035 travel demand modeling for the preferred alternative, which will include one tolling structure (tolling I-5 only; one set of tolling rates). The

CONSULTANT will provide all transportation network details to Metro/RTC, including highway and roadway lane capacities and speeds, and transit parameters. Metro/RTC will provide all 2035 travel demand modeling results to the CONSULTANT. The modeling will be conducted for four-hour a.m. peak period conditions, one-hour midday peak period conditions, and four-hour p.m. peak period conditions.

The CONSULTANT will compare the 2035 results with the 2030 travel demand modeling results. Based on this comparison, the CONSULTANT will calculate traffic growth factors for the I-5 highway system. The CONSULTANT will review these factors with the project's Modeling Working Group. The factors will be applied to the 2030 post-processed traffic demands to estimate 2035 traffic demands. These 2035 demands will be input to the VISSIM model.

The VISSIM model will be used to evaluate 2035 freeway operations for I-5 within the Bridge Influence Area. Travel speeds, vehicle densities, and traffic queues will be estimated using VISSIM for the four-hour a.m. and four-hour p.m. peak conditions. The CONSULTANT will extrapolate this data to estimate 16-hour operations (5 a.m. to 9 p.m.).

The CONSULTANT will estimate 2035 traffic demands for seven proposed interchanges in I-5's Bridge Influence Area. Using Synchro/SimTraffic, the CONSULTANT will evaluate intersection operations at each interchange's ramp terminals and at up to four additional intersections for each interchange area. The intersection analysis will be conducted for one-hour a.m. and one-hour p.m. peak periods.

Assumptions:

- Freeway and interchange traffic analysis for I-5 mainline in 23-mile corridor, I-5 ramp terminal intersections in Bridge Influence Area.
- Arterial and local roadway analysis limited to ramp terminal intersections plus up to four additional intersections for each interchange.
- VISSIM run to be completed for preferred Build alternative for year 2035.
- Synchro/SimTraffic to be used to evaluate ramp terminals and up to four additional intersections for each study interchange.

Deliverables:

The CONSULTANT will provide:

- Traffic Analysis Findings Memorandum for I-5 Mainline and Ramp Terminals – Year 2035 (AF5004)

5.6 Opening Year Traffic Forecasts and Traffic Analysis

The CONSULTANT will interpolate existing traffic counts and previously-generated year 2030 traffic forecasts to develop opening year traffic forecasts for mainline I-5 and its ramps within the Bridge Influence Area. The CONSULTANT will review the opening year forecasts with the

project's Modeling Working Group and input the forecasts into the VISSIM model considering the ultimate build scenario.

The VISSIM model will be used to evaluate opening year freeway operations for I-5 within the Bridge Influence Area. Travel speeds, vehicle densities, and traffic queues will be estimated using VISSIM for the four-hour a.m. and four-hour p.m. peak conditions. The CONSULTANT will extrapolate this data to estimate 16-hour operations (5 a.m. to 9 p.m.).

Assumptions:

- Opening year freeway traffic analysis for I-5 in Bridge Influence Area.
- Opening year analysis will not be conducted for intersections.
- VISSIM run to be completed for preferred Build alternative for opening year.

Deliverables:

The CONSULTANT will provide:

- Traffic Analysis Findings Memorandum – Opening Year. (AF5005)

5.7 Tolling Analysis Support

The CONSULTANT will support tolling analysis with technical data and products on an as-needed basis throughout the duration of the task order. Services may include peak hour forecasts, ADT projections, diversion calculations, etc.

Assumptions:

- Services to be conducted on an “as-needed” basis with a not-exceed budget limit.

Deliverables:

The CONSULTANT will provide:

- Data summaries as appropriate (deliverable number assigned when identified)

5.8 Traffic Analysis of Alternative Configurations (e.g. Auxiliary Lane Options)

The CONSULTANT will conduct transportation performance analysis for up to two alternative auxiliary lane configurations for the 2035 Build alternative analyzed in Task 5.6. The traffic operations analysis for I-5 will focus on the interstate in the I-5 Bridge Influence Area using VISSIM traffic operations software. The VISSIM model will be used to evaluate merging, weaving and diverging operations.

Assumptions:

- Freeway traffic analysis for I-5 in Bridge Influence Area.

- Up to two VISSIM runs to be completed for alternative configurations to the preferred Build alternative (i.e., auxiliary lane options).

Deliverables:

The CONSULTANT will provide:

- Traffic Analysis Findings Memorandum. (AF5006)

5.9 Traffic Operations Analysis of Alternative HCT Alignments and Park-n-Rides

The CONSULTANT will conduct traffic operations analysis on up to two HCT alignments in Vancouver. The traffic analysis will include redistribution and assignment of traffic volumes based upon proposed roadway configurations, and conducting roadway performance analysis using Synchro/SimTraffic. All analysis will be conducted for year 2035 by factoring previously-generated 2030 traffic demands based upon the results of Task 5.5. Up to 30 intersections will be evaluated for both alignment options. Morning and afternoon/evening peak hour analyses will be conducted to assess intersection level-of-service, and vehicle delay and queuing.

The CONSULTANT will forecast vehicle trip generation for the proposed park-and-ride stations for each of the alternatives. The forecasts will be based upon proposed number of parking spaces and provision of kiss-and-ride and bus transfer facilities. The roadway analysis described above will include park-and-ride generated traffic.

The CONSULTANT will develop one VISSIM model for simulation purposes. The model will be prepared to simulate one peak period under 2035 conditions. It will show high-capacity transit and traffic operations along two street corridors totaling 10 blocks (e.g., five blocks along each street corridor).

Assumptions:

- Two Vancouver HCT alignments to be evaluated for a.m. and p.m. peak hour conditions
- One VISSIM model to be developed for simulation purposes only and for one peak period

Deliverables:

The CONSULTANT will provide:

- Alternative HCT Alignments Traffic Analysis Memorandum. (AF5007)
- VISSIM Simulation (AF5008)

5.10 Interchange Access Modification Request (IAMR) Final Report

The CONSULTANT will prepare a final Interchange Access Modification Request (IAMR) for I-5 Bridge Influence Area interchanges in Washington and Oregon. The IAMR will combine the

requirements of Washington's Interchange Justification Report (IJR) and Oregon's Interchange Modification Request (IMR) and produce a single document that will be vetted through each state and its FHWA division before being sent to FHWA in Washington, D.C. for approval.

The CONSULTANT will develop a final IAMR to be completed in accordance with Federal and ODOT policy, and Chapter 1425 of the Washington State Design Manual relating to modifying access to the Interstate System. Elements to be considered in the IAMR are as follows:

- Need for the Access Point Revision
- Reasonable Alternatives
- Operational and Accident Analyses
- Access Connections and Design
- Land Use and Transportation Plans
- Future Interchanges
- Coordination
- Environmental Processes

The CONSULTANT will meet with a support team consisting of staff from FHWA, WSDOT, and Local Agencies for support and direction of the IAMR.

Assumptions:

- Traffic methods, data, and analysis will be completed with data developed in Task AD.
- Analysis will be completed for current year and design year for the No Build Analysis.
- Build Analysis will be completed for the design year.
- Opening year analysis will be completed in conjunction with the FEIS.
- Engineering team to provide the following data to support the IJR: design speeds, horizontal and vertical alignments, ramp terminal spacing, and weaving distances.
- Traffic team to provide the following data to support the IJR: truck volumes, peak hour factors, intersection and ramp volumes, safety data, and operations.
- One IAMR will be developed to cover all Interchanges that fall within the CRC project limits.
- Facilitation of up to six IAMR Support Team meetings.
- STATES will provide comments to the draft IAMR within 15 business days.

Deliverables:

- The CONSULTANT will provide a draft Interchange Access Modification Report and submit to STATES for review and provide review and response for up to two rounds of comments. The CONSULTANT will provide the Final IAMR not later than 15 business days after receipt of agency final comments. (AF5009)

5.11 IAMP Coordination

The CONSULTANT will support others with technical data and products needed to complete an IAMP for the interchanges in Oregon in accordance with ODOT's Guidelines for Interchange Area Management Plans.

The CONSULTANT will meet with a Technical Advisory Committee (TAC) consisting of staff from FHWA, ODOT, and Local Agencies for support and direction of the IAMP. The final IAMP will be completed in conjunction with the FEIS.

Assumptions:

- Traffic methods, data, and analysis will be based upon Build alternative results developed in Task AD and AF.
- No new data will be developed.

Deliverables:

- None.

5.12 Freeway and Interchange Area Design Support

The CONSULTANT will support freeway and interchange area design support with technical data and products on an as-needed basis throughout the duration of the task order. Services may include highway and intersection operational analysis, input on intersection needs (turning lane storage lengths, signal phasing), etc.

Assumptions:

- Services to be conducted on an "as-needed" basis with a not-exceed budget limit.

Deliverables:

- Memoranda documenting interchange design and operational information, as-needed. (deliverable number assigned when identified)

5.13 Local Street Design Support

The CONSULTANT will support local street design support with technical data and products on an as-needed basis throughout the duration of the task order. Services may include intersection operational analysis, input on intersection needs (turning lane storage lengths, signal phasing), etc.

Assumptions:

- Services to be conducted on an "as-needed/requested" basis with a not-exceed budget limit.

Deliverables:

- Memoranda documenting local street design and operational information, as-requested. (deliverable number assigned when identified)

5.14 Pedestrian and Bicycle Facility Design Support

The CONSULTANT will support pedestrian and bicycle design efforts with technical data and documentation on an as-requested basis throughout the duration of the task order. Services may include supporting pathway design details (cross-section, separation of modes, at-grade and grade-separated connections, etc.), bicycle lane details (intersection configurations, pavement markings, routing, etc.), and pedestrian walkway details (intersection needs, crosswalks, signal phasing, etc.).

The CONSULTANT will coordinate with the project's engineering team and the Pedestrian and Bicycle Advisory Committee as a part of this task.

Assumptions:

- Services to be conducted on an "as-needed/requested" basis with a not-exceed budget limit.

Deliverables:

- Memoranda documenting design and operational information, as-requested. (deliverable number assigned when identified)

5.15 Construction Staging Support

The CONSULTANT will support the CRC engineering team by providing input on construction staging and phasing activities on an as-needed/requested basis throughout the duration of the task order. Services may include conducting capacity analysis to determine lane needs along detour routes, input on construction staging and phasing plans, weaving analysis, staging recommendations, etc.

Assumptions:

- Services to be conducted on an "as-needed/requested" basis with a not-exceed budget limit.

Deliverables:

- Memoranda documenting design and operational information, as-needed. (deliverable number assigned when identified)

5.16 Special Technical Studies

The CONSULTANT will conduct special technical studies related to traffic, freight, transit, managed lanes, pedestrian and/or bicycle conditions. The special technical studies will be conducted on an as-needed basis.

A special technical study could involve items not described elsewhere in Work Element 5.0 such as:

- Research
- Development of presentation materials
- Evaluation of conditions
- Preparation of technical analysis

Assumptions:

- Individual work orders will be prepared for all Special Technical Studies.
- Assumed not-to-exceed fee for Special Technical Studies when individual task orders are issued.

Deliverables:

- The CONSULTANT will prepare Technical Memoranda for Special Technical Studies, as appropriate (deliverable number assigned when identified)

5.17 Traffic Support for Other Disciplines

The CONSULTANT will support other CRC disciplines with technical data and documents on an as-needed basis throughout the duration of the task order.

The CONSULTANT transportation planning team will support the following project teams:

- Transit Team
- Engineering Team
- Environmental Team
- Tolling Team
- Traffic Support for Other Disciplines

The CONSULTANT transportation planning team will provide support to the following working groups:

- Modeling Working Group
- Transit Working Group
- Freight Working Group
- Pedestrian and Bicycle Working Group
- Engineering Working Group
- Community and Environmental Justice Working Group
- Traffic Support for Other Working Groups

Assumptions:

- All work will be provided on an “as-needed/requested” basis with a not-to-exceed budget limit

Deliverables:

- The CONSULTANT will provide data summaries as appropriate (deliverable number assigned when identified)

5.18 FEIS Preparation

The CONSULTANT will respond to all traffic and safety related comments received on the DEIS. Responses may require conducting additional traffic and safety analysis. This task assumes a not-to-exceed budget amount for any potential additional analysis.

The CONSULTANT will provide written input to the FEIS.

Assumptions:

- All DEIS comments will be sorted and provided to the CRC Traffic Team in an administrative tracking format.
- The STATE’s and local jurisdictions make the final determination and election on safety questions and alternatives.

Deliverables:

The CONSULTANT will provide:

- Responses to DEIS comments, as appropriate (AF5010)
- Update of Traffic Technical Report with revisions incorporating FEIS changes (AF5011)

6.0 ENVIRONMENTAL

The purpose of this work element is to coordinate and prepare environmental analysis and technical reports to comply with the National Environmental Policy Act (NEPA), to support environmental permitting, and address other environmental and related needs. This will include the preparation of a Final Environmental Impact Statement (FEIS) and a Record of Decision (ROD). It will also include preparing permit applications, and identifying and preparing environmental mitigation and enhancement plans, as appropriate. The assumed timeframe for these services is approximately 16 months, between September 1, 2008 and December 31, 2009.

Significant assumptions and deliverables are listed under each task below.

6.1 Environmental Task Management

This task will provide general coordination with the STATES, local sponsors, NEPA Federal Co-Lead Agencies, and project staff, to coordinate environmental elements with the rest of the project team's efforts, as well as the general budget and contract management for this Task Order. This task will also provide CONSULTANT quality control (QC) for task 6.0 Environmental. Coordination with the larger project team will entail attendance at regular project management meetings, and providing input and updates to environmental elements of project efforts and to the project schedule. Budget and contract management will include budget tracking, preparation of monthly invoices, and monthly progress reports.

Assumptions

- Efforts under this task will continue for the duration of this Task Order, assumed to be 15 months
- Attendance at bi-weekly PDT meetings
- Attendance at bi-weekly meetings with the CONSULTANT project managers
- Attendance at special meetings with staff from Federal, City, County, and other agencies and organizations as directed by the CONSULTANT
- Participation in approximately 12 SASS meetings or mini-PDT meetings
- Environmental task lead meetings
- Up to 2 full environmental team meetings
- The CONSULTANT will attend up to 12 deliverables/document control meetings
- The CONSULTANT will provide Monthly progress reports (15)
- The CONSULTANT will provide Monthly invoices (15)

All references to deliverable due dates cited in Task 6 are based on the CRC schedule as of the time when this statement of scope has been prepared. However, the CRC schedule may require refinements to these due dates without amendment to this Statement of Work, but with documentation of such changes noted and agreed to in internal written correspondence between the CONSULTANT's Environmental Manager and the STATE's Environmental Manager.

6.2 NEPA Public Involvement Support

The CONSULTANT shall provide support to the communications and public involvement efforts. This will include staffing at selected meetings and events and environmental information for display and communication. Comments collected after the 60-day DEIS public comment period will be documented and made available to the public, project staff, partner agencies, and advisory committees, as appropriate.

6.2.1 Public Involvement Team Meetings

One (1) Consultant staff shall attend the CRC public involvement team on a bi-weekly basis to provide ongoing coordination between the public involvement and environmental teams.

6.2.2 Working Groups, Outreach Events and Issue Workshops

The CRC communications team shall manage working group meetings and educational and outreach events. Public involvement and communications related to these meetings and events shall be managed by others. CONSULTANT's role is to participate in strategy and delivery related to NEPA, regulatory requirements and environmental issues.

6.2.3 Monthly Comment Updates

CONSULTANT shall prepare brief summaries of the public and agency input received on a monthly basis. The summaries will be shared with the CRC communications team which will include the summarized data in their monthly *Communications Summary*. The purpose of including these comment summaries in the *Communications Summaries* is to provide the project team with a brief overview of input received so that input can be incorporated, as appropriate, into project development and implementation. These *Communications Summaries* can also be used distributed to advisory groups and others to keep them apprised of comment trends.

Activities include:

- Receive public, agency, and Tribal government comments. Comments may come from agency and Tribal coordination efforts as well as from the communications team managed educational and outreach events, the project team website, and the WSDOT contact database.
- Load comments into a database, and organize comments into comment "groups" or themes."
- Summarize and paraphrase the comments by comment "groups" or "themes" And distribute the summary to the communications team.

6.2.4 Public Involvement Technical Memo

CONSULTANT shall prepare a technical memo summarizing the public and agency involvement activities, input received, and actions taken after the DEIS comment period. The purposes of the report will be to (1) provide the project team with a summarized version of input received and how it was incorporated into project development and implementation, and (2) provide to the public and other stakeholders, a summary record of comments received and how those comments have influenced project development and implementation. Activities include:

- Prepare and circulate preliminary draft (including summary of educational and outreach activities and summary of comments) for ODOT and WSDOT review.
- Prepare and circulate draft public involvement technical report for review and comment by: WSDOT, ODOT, FTA, FHWA, Metro, TriMet, C-TRAN and RTC.
- Revise preliminary and draft public involvement technical memos and produce final public involvement technical memo.

- Provide the final technical memo to the Communications team for posting on the project web site.

Assumptions for 6.2

CONSULTANT will assist in preparation and strategy for, and attendance of, up to ten (10) public working group or outreach events

Deliverables for 6.2

- Prepare up to twelve (12) brief comment updates
- Public Involvement Technical Memo (AF6001)

6.3 Engineering, Traffic and Transit Team Support

The CONSULTANT shall provide support to and coordination with the engineering, traffic and transit teams. This will include identifying data and information needed from these other teams for environmental analysis, coordinating analytical approaches and results, reviewing draft documents produced by other teams, and providing data and analysis for inclusion in various products produced by other teams.

6.3.1 Assist design team in reducing impacts and developing appropriate mitigation

This task provides for coordination with the engineering of the LPA to assist in design work to reduce impacts and develop mitigation. Work includes developing strategies and gaining consensus on issues pertinent to environmental impacts, regulatory compliance, and mitigation. This will include identification of best management practices, conservation measures, impact avoidance measures, compensatory mitigation, valuation of ecosystem functions, habitat restoration, construction monitoring needs, and long-term monitoring requirements. Decision documents and presentations will be prepared as necessary for communication regarding environmental impacts and mitigation.

Assumptions

- Drawings for conceptual mitigation prepared by CONSULTANT will be budgeted in other tasks.
- Attendance of up to two engineering and design meetings per month

Deliverables

- Conceptual mitigation designs (AF6002)

6.3.2 Contaminated Media Management for the Geotechnical Drilling Program

The CONSULTANT will prepare a Contaminated Media Management Plan (CMMP) for the project area for the possible adoption by the STATES. The primary purpose of the CMMP is to provide a basis for management of contaminated media encountered during subsurface activities, primarily geotechnical drilling. The CMMP will be developed to outline the decision making process, contact information, and procedures for characterizing, managing, storing, and

disposing of contaminated media. Materials covered under the CMMP will include investigation derived waste (IDW) such as drill cuttings, drilling fluids, decontamination water, groundwater, and construction debris.

Activities

- Prepare a comprehensive Contaminated Media Management Plan (CMMP) for the project area for the possible adoption by the STATES.

Assumptions

- Prepare for and attend up to two meetings regarding the CMMP.
- Review and respond up to two rounds of comments from the agencies regarding preparation of the CMMP.
- Prepare one draft and one final copy of the CMMP.

Deliverables

- Contaminated Media Management Plan (CMMP) (AF6003)

6.3.3 Hazardous Materials Support during Geotechnical Drilling Program

This task will support the characterization, management, storage and proper disposal of investigation derived waste (IDW) generated during the geotechnical drilling program. It is the CONSULTANT's assumption that a limited geotechnical drilling program will be conducted in one event.

Activities

- Conduct one meeting regarding the geotechnical drilling program.
- Project coordination and communications with drilling and laboratory subconsultants.
- Provide field oversight at two drill locations suspected to have subsurface contamination.
- Prepare a hazardous materials storage inventory list. (AF6005)
- Conduct sampling of IDW for the purposes of characterization. Submit samples to analytical laboratory for analysis.
- Provide project communications and help the CRC's coordination with its subcontractors to handle and dispose of IDW.
- Prepare a technical memorandum summarizing findings and documenting activities. (AF6006)

Assumptions for 6.3.3

- The drilling program will be conducted in a manner consistent with the CMMP.
- Field oversight will be conducted at up to two (2) geotechnical borings that have suspected subsurface contamination.

- CONSULTANT staff will conduct field effort activities consistent with the Health and Safety Plans (HASP). The HASP will pertain only to CONSULTANT field staff and meet relevant and applicable ODOT and WSDOT requirements. (AF6004)
- Drilling locations are the responsibility of CRC. CONSULTANT is not responsible for borehole location approval and utility clearance.
- CONSULTANT will conduct contaminant sampling screening on borings where direct oversight is necessary. Screening will be used to direct IDW segregation and storage.
- A copy of the HASP and media management inventory list will remain in the IDW storage area.
- IDW samples will be submitted to the laboratory for waste characterization.
- Laboratory services will be procured and contracted by the STATES.
- Prepare for and attend one meeting regarding the geotechnical drilling program.

6.4 Regulatory Agency Coordination

CONSULTANT shall facilitate coordination efforts with state and federal regulatory agencies regarding decisions to be made during the FEIS phase of the project. This includes implementation of the InterCEP agreement as well as other agency coordination. Tasks will include:

- Organize and help direct and facilitate meetings with the InterCEP resource agency representatives as well as overall coordination with these agencies.
- Maintain regular communication between the environmental team and the FTA, FHWA, WSDOT, ODOT and resource agencies.
- Organize and help direct subgroup meetings with selected representatives from resource agencies.
- Develop InterCEP concurrence and comment packages for review, revision and refinement.
- Coordination between the environmental team's work with CRC and agencies' efforts.
- Participate in up to two meetings and coordination with Participating Agencies
- Participate in up to three meetings with Portland TAC

Assumptions

- There will be up to three InterCEP meetings.
- Coordination with resource agencies will largely follow the InterCEP agreement process.
- Sub-groups will only be developed as needed and only as long as needed, to resolve specific issues.

Deliverables

The CONSULTANT will provide:

- InterCEP concurrence package for the Preferred Alternative and Conceptual Mitigation Plan (AF6007)
- InterCEP comment package for the Preliminary Final EIS (AF6008)

6.5 Cultural and Related Resources Coordination

Under this work element, the CONSULTANT will coordinate the policy and procedural requirements of NEPA and the Washington State Environmental Policy Act, Section 106 of the National Historic Preservation Act (NHPA), DOT Act Section 4(f) (with respect to archaeological and traditional cultural properties [TCPs]) and state cultural resource regulations, with the Oregon State Historic Preservation Office (SHPOs), the Washington Department of Archaeology and Historic Preservation (DAHP), the National Park Service, the US Army, the cities of Vancouver and Portland, and other Section 106 consulting and interested parties. This work element also will include assisting WSDOT and ODOT in informing tribal governments on the process for soliciting public comments and with preparation and staffing for the tribal scoping and/or Consultation and coordination meetings, required by federal and state laws.

This work element addresses responsibilities for the CONSULTANT's cultural resources team, as overseen by the CONSULTANT's cultural resources manager. The STATE's Cultural Resources Staff will have primary responsibility for overseeing the Field Archaeology CONSULTANTS and the NPS

Because most archaeological resources are buried and veiled, archaeological investigations are necessarily phased to first implement a set of techniques to discover if archaeological sites are present, and to secondly, based on the limited understanding of conditions surrounding discovered sites, apply a refined set of techniques to determine the boundary and evaluate the significance of the sites. The appropriate techniques and level of effort required for each phase of investigation substantially relies on the results of the previous phase. This sequentially informative process affects the decreasing levels of certainty regarding anticipated activities and levels of effort required to conduct those activities as the project moves from site discovery to the site evaluation phases and beyond.

6.5.1 Archaeological Resources Discovery

Archaeological resources discovery investigations are conducted to determine the presence or absence of archaeological sites.

The CONSULTANT will coordinate with:

- CRC Environmental Manager and other engineering/design staff, and the Section 106 consulting parties regarding potential refinements to the boundary of the archaeological and historic built-environment areas of concern within the project's Area of Potential Effect (APE).

The CONSULTANT will participate in meetings and inspections; and review technical documentation associated with:

- Geo-Technical Exploration Monitoring

- Archaeological Permitting (State)
- Ground Penetrating Radar (GPR)
- Geo-Cores for Archaeological Discovery
- Pedestrian Survey
- Shovel Probing for discovery phase
- Mechanical Trenching for discovery phase
- Historic Built-Environment and Archaeology Technical Report series
- Oral History Review and Coordination with CRC Tribal Liaison and Field Archaeology Consultants

6.5.2 Archaeological Support

The CONSULTANT will respond to formal comments received regarding the DEIS and coordinate them through the CRC office.

The CONSULTANT will coordinate and review documentation associated with compliance with federal and state cultural resource laws, such as refinements to the Research Design Plan. The CONSULTANT will also coordinate with the Field Archaeology consultants to draft and finalize documents associated with compliance, including:

- Finding of Effects (FOEs) for archaeological resources for which enough testing and significance evaluation has been conducted under this work order to substantiate such findings
- A Memorandum of Agreement (MOA) for the CRC project to review, negotiate, and execute as the STATES feel appropriate.

6.5.3 Historic Built-Environment and Coordination with Other Technical Analyses

The CONSULTANT's Cultural Resource Manager will:

- Coordinate the activities of CONSULTANT's historic built-environment specialists with CRC, DAHP, SHPO, and NPS and other section 106 consulting parties.
- Coordinate the activities of the CONSULTANT's historic built-environment specialists and the Field Archaeology CONSULTANT with CONSULTANT's Section 4(f) specialists.

Assumptions for 6.5

- The VNHR National Register Historic District consists of an archaeological landscape comprising several archaeological sites previously assigned Smithsonian trinomial designations and a more or less continuous distribution of artifacts scattered over and under the ground in differing densities. Based on previous consultations between NPS, DAHP and CRC, all subsurface excavations conducted by the NPS within the CRC APE and VNHR will be considered testing phase activities that are geared toward evaluating archaeological resources within the VNHR National Register Historic

District to determine if they can significantly contribute to answering questions that are important to understanding the prehistory/history of the District. Activities that typically would be considered discovery efforts, such as GPR investigations, are intended to support this evaluation.

- Staff providing archaeological field investigations, archaeological field pedestrian surveys, GPR investigations, subsurface discovery, testing excavations, and data recovery efforts, as well as the Principal Investigator, are not included in this task. They are in Task 6.7.2.
- Coordination and oversight of the Field Archaeology CONSULTANTs, including the NPS (who will be conducting archaeological investigations within the VNHR), and Heritage Research Associates (HRA), will be conducted by STATE Cultural Resources Staff. Coordination by STATE will include discovery investigations and consultation with other CRC engineering/design staff regarding archaeological resources identification and discovery methods to be conducted within the refined APE (including project footprint, natural resources mitigation areas as well as staging sites)
- Coordination with the CRC Project Tribal Liaison to involve tribal representatives will be conducted by STATE Cultural Resources Staff.
- STATE Cultural Resources Staff will coordinate archaeological testing and significance evaluation with the Field Archaeology consultants and other parties.
- The CONSULTANT will not participate in on-site field meetings and site inspections, unless directly related to reviews and decision making regarding preparation of the FOE and MOA;
- STATE Cultural Resources Staff will be responsible for coordinating review and editing of technical documentation associated with: Field Work; Archaeological permitting (State); Archaeology Technical Report series
- STATE Cultural Resources Staff will coordinate, arrange, attend and prepare and circulate notes or minutes of meetings regarding consultation, coordination, and compliance. Meetings may include and be associated with: Cultural Resources Team; National Park Service (NPS); Inter-Tribal; Joint Consulting Parties
- The CONSULTANT will oversee internal preparation, review and revisions to the Historic Built-Environment Technical Report Series and review and revisions for up to five (5) manuscripts for an Archaeology Technical Report Series.
- The STATE's Cultural Resources Staff will submit Technical Report Series manuscripts (prepared by the Field Archaeology CONSULTANTs and reviewed by the CONSULTANT) to the WSDOT and ODOT technical representatives to the CRC Project and who, upon their approval of the reports will submit them to the DAHP, and SHPO archaeologists assigned to CRC, and to the Indian tribes, and other consulting parties.
- The CONSULTANT will be responsible for responding to up to twenty-five [25] formal comments received on the DEIS.

- Post-LPA refinements to the project area may include up to fifteen (15) acres of land lying beyond the areas within which direct impacts were assessed for the DEIS and/or the CRC project's DEIS APE. This area will be investigated but it is assumed that it will not result in discovery of additional historic built-environment properties.
- Potential changes in the construction footprint of project roadway, bridge, transit, and ancillary facilities considered in the DEIS will not increase the number of historic built-environment properties that need to be inventoried in more detail and/or assessed or reassessed for potential effects.
- Refinements to the CRC project APE's areas of concern, each of which are contained within the APE, will not require re-initiation of the APE concurrence process, but will require written notification and explanation of the refinement with section 106 consulting parties.
- CONSULTANT's cultural resources manager and one assistant will attend up to three (3) meetings with CRC engineering, design and environmental planning staff to consider avoidance and minimization measures based on archaeological data.
- Investigations are not expected to discover any Traditional Cultural Properties.
- The section 106 process must be completed prior to execution of the NEPA ROD, however the completion of the section 106 process may require additional work not covered by this scope of work and budget estimate. Also, based on earlier consultation with DAHP and SHPO (as yet unconfirmed by FHWA and FTA), the completion of the 106 process for purposes of this statement of work, involves CONSULTANT preparing one (1) MOA that will stipulate how known and unavoidable adverse effects to historic properties will be mitigated, and establish a program on how potentially remaining elements of the section 106 process will be completed after the ROD and in accordance with the intent of the NHPA. STATE will offer ACHP involvement in the MOA process. CONSULTANT and STATE assume that the ACHP will participate as a signatory to the MOA, but will provide only editorial comments on it and no substantive comments that require changes in the CRC cultural resource program's approach, strategy, field work, interpretations, consultations, and on the MOA's preamble, whereas statements, stipulations and treatments, or programmatic approach and requirements..
- The CONSULTANT will lead up to two (2) major coordination efforts with project GIS support.
- The STATE will generate meeting minutes and notes for meetings held independently with the NPS, tribes, FHWA, and FTA and distribute to the consultant Cultural Resources Manager, portions pertinent to completing this scope of work.
- CONSULTANT will not be required to prepare or review drafts of any ARPA permit because the NPS will be responsible for doing all archaeological work on NPS and U.S. Army Reserve property within the VNHR, and because the FHWA-Western Federal Lands will not require an ARPA permit for either the CONSULTANT, NPS, or Field Archaeology CONSULTANT to do FHWA-sponsored archaeological work on their property.

- The STATES will secure Rights of Entry for all cultural resource investigations, and the STATE Cultural Resources Staff will coordinate the process with appropriate CRC staff.
- Review of the Comprehensive Archaeological Discovery and Testing Status document is expected to be due in late November 2008 in order to be included in Finding of Effect Documentation, which is expected to be needed by January, 2009.
- Up to eight (8) archaeological sites will be discovered and will require various levels of subsurface test excavation by the Field Archaeology CONSULTANT. (Note: This assumption, and others, is intended to put parameters on the budget. Additional archaeological sites may be identified that may need to be tested in order to inform preparation and completion of the FEIS, ROD and/or Section 106 process/MOA).
- The Research Design Plan (prepared by the Field Archaeology Consultant) will need periodic review during the project, and will result in one (1) revision that will be managed by STATE Cultural Resources staff..
- One (1) Finding of Effect document (drafts and final) is expected to be submitted to SHPO and DAHP by February 1, 2009, in order to inform development of the FEIS and draft MOA in a timely manner; the Finding of Effect will address effects to cultural resources that have been evaluated for significance consistent with this scope of work (recognizing that additional work may be required).
- The STATE's Cultural Resources staff will prepare for, facilitate, coordinate and prepare minutes/notes for: meetings to review archaeological resources identification and site discovery evaluation results; strategy meetings for archaeological discovery and testing with the CRC Cultural Resources Team, interested Tribes (coordinated with the CRC Tribal Liaison), and CRC STATES environmental manager; consulting party meetings to discuss MOA and archaeological concerns; meetings with Cultural Resources Team to discuss the Research Design Plan refinements; van tour to discuss location of proposed fieldwork or project status; inter-tribal meetings; meetings to review archaeological testing evaluations results; bi-weekly Cultural Resources team meetings; bi-weekly NPS/CRC meetings.
- Of the above listed meetings, the CONSULTANT Cultural Resources Manager will attend and facilitate Section 106 coordination (including preparation of FOE and MOA) issues for up to:
 - Eight (8) consulting party meetings to discuss MOA and archaeological concerns, with six (6) occurring at Tribal local offices, and the other two (2) occurring in Vancouver.
 - One (1) meeting in Vancouver with Cultural Resources Team to discuss the Research Design Plan refinements.
 - One (1) van tour to discuss location of proposed fieldwork or project status
 - Thirty (30) bi-weekly NPS/CRC meetings including 15 in Vancouver and 15 by phone.
- This task does not include hiring Court Reporters for meetings.

- No archaeological historic/prehistoric properties will be National Register-eligible for reasons other than for the information that they contain (Criterion D); SHPO and DAHP will not require assessment of historic property significance except pursuant to Criterion D; all archaeological historic properties will have minimal value for preservation in place.
- The CONSULTANT will not need to be involved in coordinating any CRC consideration of any traditional cultural property within or outside the CRC APE.
- The CONSULTANT will not need to be involved in coordinating any CRC cause to implement regulations associated with the Native American Graves Protection and Repatriation Act.
- The CONSULTANT's Cultural Resources Manager will review one (1) historic built-environment technical document that will update the section 106 process with respect to post-LPA CRC design modifications.
- The CONSULTANT will not be required to bring on a cultural landscape sub-consultant to assist with issues regarding the cultural landscape of the Fort or other historic property.
- Anticipating all cultural resources work that will be necessary to complete the NEPA FEIS, ROD and/or Section 106 process (i.e., MOA) is difficult during the current discovery phase. Because of the buried nature of archaeological resources and the phased nature of archaeological investigations, and the potential for additional historic built-environment work, additional cultural resources work may be needed, but cannot be known without further investigation and coordination. This phased approach to the work and to scoping and budgeting the work, may result in the need for additional cultural work that is not currently budgeted.

Deliverables for 6.5

The CONSULTANT will provide:

- One refinement of the APE areas of concern (provided post-LPA designs change project direct-impact footprints) (AF6009)
- One (1) MOA (AF6010)
- One (1) FOE. (AF6011)

6.6 Technical Reports

Under this work element, CONSULTANT shall update and prepare final technical reports to support the FEIS for the following disciplines:

- Acquisitions, displacements and relocations, (AF6012)
- Ecosystems, (AF6013)
- Electro-magnetic fields, (AF6014)
- Energy and greenhouse gases, (AF6014)

- Environmental justice (including a Fixed Facility Impact Analysis), (AF6015)
- Geology and soils, (AF6016)
- Hazardous materials, (AF6017)
- Historic resources, (AF6018)
- Land use, (AF6020)
- Neighborhoods and population, (AF6021)
- Public services, (AF6022)
- Parks and Recreation and Section 6(f), (AF6023)
- Visual quality and aesthetics, (AF6024)
- Water quality and hydrology (AF6025), and
- Wetlands (AF6026).

Assumptions

- Technical reports will address a No-Build Alternative and the Locally Preferred Alternative. No updated analysis will be required for the other alternatives or options that are not part of the LPA. The LPA to be analyzed in the technical reports will be the Replacement bridge with LRT terminating at Clark College. For analysis, it will be defined by a single transit alignment, bridge type, tolling scenario, and will not require analysis of multiple options.
- Technical reports will include: regulations and standards, affected environment, environmental consequences, mitigation measures, and a list of permits and approvals. Appendices may be included for some disciplines.
- CONSULTANT will update relevant sections of each tech report (that was drafted during the DEIS phase) to: reflect relevant new information regarding the affected environment, major changes in policy or regulations; update impact analysis based on a refined design for the LPA; refine mitigation measures.
- This work element will cover up to two drafts and one final technical report for each discipline area.
- Methods and analytical techniques will generally be the same as those used for technical reports prepared under Task Order AD in support of the DEIS, unless otherwise noted for specific disciplines within the subsections of this task. On-going review of the comments received on the DEIS, subsequent coordination with agencies, and decisions regarding how the project will address various conditions associated with the LPA approval, may reveal the need for additional information or analysis not currently anticipated. Such additional work would be subject to direction and approval by the AGENCY.
- The technical report schedule may be subject to change if there are changes to design assumptions or other input necessary from other team members or the AGENCY.

- AGENCY will directly provide or direct pay for technical report printing costs. The following technical reports are being prepared and formatted under other tasks and are not part of Task 6. However, as part of Task 6, CONSULTANT will coordinate with the writers of these technical reports and will provide one review for consistency with the Task 6 technical reports:
 - Transit Technical Report (AF6027)
 - Traffic Technical Report (traffic, freight, ped/bike, parking) (AF6028)
 - Navigation Technical Report (AF6029)
 - Aviation Technical Report (AF6030)
 - Utilities Technical Report (AF6019)
 - Finance Report
- The Environmental Team shall receive the following information or products from other project team members or the AGENCY, to complete the work in this task. Once these products are received by the Environmental Team, and impact analysis has begun, it is assumed that there will be no changes to these products that would require substantially restarting or revising the analysis.
 - Regional travel demand model output
 - Traffic analysis output
 - Project design information including plans, profiles, cross-sections, and selected details
 - Visual simulations
 - Project descriptions
 - Right-of-way report describing parcels affected, partial or full acquisitions, area required permanently and temporarily, and uses displaced, for the LPA
 - Right-of-way mapping showing the proposed new permanent ROW line and temporary easements overlaid on existing parcel boundaries, at a level of accuracy and precision adequate for finalizing the Section 4(f) Evaluation, the Biological Assessment, the Section 106 MOA, and the FEIS cost estimates.
 - Description of assumed construction schedule and techniques, including construction haul routes, traffic detours, traffic reroutes, in-water work, and other assumptions necessary to complete regulatory compliance through the ROD.
 - Locations of, and proposed activities on, proposed construction staging or assembly sites.

Deliverables for 6.6

The CONSULTANT will provide:

- Final Report for each discipline

6.6.1 Acquisitions, Displacements and Relocations

The Acquisitions, Displacements, and Relocations technical report will address the following, based on the LPA design:

- Acres of land and number of parcels that would be acquired, including identifying partial and full acquisitions and describing the current uses of land and current zoning designations of the land that would be acquired under each alternative.
- Number of displacements that would occur. This work element will estimate how many of the displacements are businesses, how many households would be displaced, and how many people would be displaced. Additionally, as data are available, the work element will describe the social characteristics (age, race, income level) of the people subject to displacement.
- To address potential mitigation strategies, the technical report will contain an assessment of vacancy rates for similar space in the area to accommodate potentially displaced businesses and/ or households.
- For some displacements, the technical report will document the functional replacement related issues and assist with preliminary recommendations for such. Initial discussions and the development of findings regarding functional replacements will be provided by STATE right of way staff.

The acquisitions and displacements analysis will include potential acquisitions, displacements, or relocations in the primary area of potential impact (API), and will focus on the direct impact area using Geographic Information Systems (GIS) data, assessors' records, field investigations, interviews with property owners, and interviews with representatives from local jurisdictions and relevant agencies. Potential short and long-term effects would be discussed in the technical report.

Special financial and incentive programs or opportunities beyond those provided by the Uniform Relocation Act may be identified or proposed with approval by WSDOT, ODOT, and the Cities of Vancouver and Portland.

Assumptions

- Information on floating home relocation will be provided by ODOT right of way staff.
- Information on functional replacements will be provided by STATE right of way staff.

6.6.2 Ecosystems

The Ecosystems technical report will discuss the LPA as it applies to fish, wildlife, and plants, and their habitats, occurring within the APIs. The report will evaluate impacts to special-status species; to habitats that support fish, wildlife, and plants; to local, state, and federally protected habitats; and to other ecosystem resources, including migratory birds, marine mammals, rare plants, and noxious weeds.

Data sources and data collection methodologies will be consistent with those described in the MDR. In a previous phase of work, the environmental team collected a list of potential special-

status species and their habitats and conducted field surveys to verify these habitat types within the APIs. The team also conducted rare plant surveys, and inspected bridges for bridge-nesting species. Habitat types were characterized and mapped using Johnson & O'Neil (2001) species/habitat matrix.

The technical report will analyze short- and long-term impacts to ecosystem resources. For aquatic resources, impacts to fish passage, sensitive habitats, and suitable and critical habitat for listed fish will be analyzed. For terrestrial resources, impacts to wildlife passage and habitats, including suitable, critical, and other protected habitats, will be analyzed. The report will also summarize the potential for adverse effects to listed species under the federal Endangered Species Act (ESA), based on the analysis and findings prepared for the Biological Assessment. Potential beneficial impacts of the proposed alternatives will also be evaluated. The report will describe mitigation measures but design drawings are not included in this scope.

6.6.3 Energy, Greenhouse Gases, and Electromagnetic Fields (EMF)

This report will consist of two topics – Energy and Greenhouse Gases. It is anticipated that the EMF report prepared for the DEIS will not need to be updated for the FEIS.

The energy analysis will estimate and evaluate the energy consumption for construction and operation of the I-5 CRC LPA and its potential effect on the regional supply and demand for petroleum and electricity.

The energy content used for construction will be estimated for the LPA and No-Build, based on updated construction assumptions and cost estimates.

The analysis of operational energy use will focus on petroleum use for vehicle operation and maintenance and electricity use for light rail operation. Existing operational energy use will determine the use of gasoline and diesel by passenger cars, light trucks, heavy trucks and motorcycles, and determine the existing use of electricity by light rail. Future electricity and petroleum use will be estimated for these same transportation elements, which will provide the basis for assessing the effect of operational use on the regional supply and demand for energy. Assumptions on fuel efficiency and other elements influencing future operational energy uses will be updated as needed to reflect the latest estimates of future energy use. The effects of tolling, gas prices, and vehicle fuel efficiencies will be addressed for the No-Build and LPA.

Updated estimates of greenhouse gas emissions will be included in this report, based on updated travel demand model output, fuel efficiency and construction assumptions. The analysis will cover up to two future scenarios. It will also provide analysis and definition of potential measures to reduce greenhouse gas emissions. Some aspects of the greenhouse gas analysis will be subject to input by an independent review panel or committee, which could change the scope of this analysis.

6.6.4 Environmental Justice

The Environmental Justice technical report will evaluate whether the LPA, with mitigation, will result in disproportionately high and adverse impacts to low-income or minority populations. This analysis will address both short-term and long-term impacts..

The Environmental Justice technical report will use information from other technical reports to identify potential impacts. For example, technical reports on air quality, noise and vibration, and transportation will provide data on the location, intensity, and duration of potential environmental effects within the region. The technical report will also use the parcel by parcel information provided as part of the Acquisitions technical report, and will assist in the data gathering for this effort.

The potential adverse and beneficial effects of tolling on minority and low-income populations will be assessed. This evaluation will update the literature review of research on the equity of tolling, a summary of concerns about tolling as collected from public outreach, travel time savings, and alternate routes effects. Finally, this technical report will identify potential measures to mitigate any adverse impacts to Environmental Justice populations.

The list of social resources located within two blocks of the entire construction zone (including highway ramps, temporary detours, and staging areas) will be updated. This later activity will include some new field work. Additional information will be obtained on the homeless populations in the study area.

CONSULTANT will also develop the draft Fixed Facility Impact Analysis. Using tax assessor and GIS data, CONSULTANT will develop:

- An inventory of minority businesses and residents within the API.
- A discussion of potential impacts on specific minority owned businesses as well as businesses that serve minority or low income communities.
- The analysis will also include data gathered through a survey of owners, employees, and residents from every impacted property. The data will be used to provide a comprehensive assessment of every potentially impacted minority or low-income person.
- Specific mitigations to avoid, minimize, and mitigate any identified impacts.

6.6.5 Geology and Soils

This task will prepare an updated Geology and Soils Technical Report for the LPA that satisfies relevant requirements of the FEIS. This will entail comparing the LPA to existing geologic, hydrologic, and geologic hazards conditions, incorporating any relevant information provided through other geotechnical investigations, and assessing long-term and short-term effects and mitigation measures for the LPA.

Assumptions for 6.6.5

- A separate Geotechnical Data Report and Design Memoranda will be prepared under a different task in regard to landslides and bridge structures. The final version of the geotechnical report or interim version of this report will be provided to CONSULTANT two months prior to the due date of the draft Geology and Soils Technical Report. Findings and conclusions from the Geotechnical Investigation Report will be included in the Geology and Soil Technical Report. CONSULTANT assumes

that investigation findings and conclusions are the sole responsibility of CRC and its subcontractor.

- Field oversight by a CONSULTANT geologist will be required at up to 15 of the geotechnical holes to help document existing conditions. Boreholes selected for oversight will be dependent on drilling locations and depths. The Contractor assumes that a minimum of fifteen boreholes will have field oversight.

6.6.6 Hazardous Materials

This task will prepare an updated Hazardous Materials Technical Report for the LPA. This will entail assessing long-term and short-term effects of potential discovery of hazardous materials, and mitigation measures for such discoveries. It will include a new Environmental Data Resources (EDR) database search for the 2008 LPA. The database search will be completed using a 1,000-foot buffer for the entire LPA. As part of the due diligence process for property purchase, Phase I Environmental Site Assessments (Phase I ESA) will be conducted on properties that will be fully acquired (TASK 6.17). Relevant available information from Phase I ESA will be incorporated into the Hazardous Material Technical Report.

Assumptions for 6.6.6

- Property that will be acquired and has recognized environmental conditions may pose a risk to project costs and schedule. To help evaluate these risks, acquisition listings will be provided to CONSULTANT. Listings will be provided 3 months prior to the due date of the draft technical report.
- A separate Geotechnical Investigation Report will be prepared by CRC and its subcontractor (under Task 8.4.5). Relevant findings or conclusions from this investigation in regards to hazardous materials will be incorporated into the Hazardous Materials Technical Report. These findings and conclusions will be provided by CONSULTANT which will be conducting oversight of the geotechnical program in regards to hazardous materials. Oversight and associated reporting will be managed under Task 6.3.

6.6.7 Historic Resources

The CONSULTANT will conduct a supplemental reconnaissance survey of land not previously surveyed as direct-impact areas for historic built-environment resources, and will prepare and submit required database and/or inventory forms to the appropriate SHPO, and modify associated resource mapping and prepare an updated Technical Report based on the LPA, to support the FEIS and MOA.

As requested by STATE's Environmental Manager, the CONSULTANT will attend Cultural Resources Team meetings, meetings between the NPS and WSDOT, and with other groups or parties.

The CONSULTANT will:

- Assist the STATE in refining the CRC APE's historic built-environment direct and indirect impact areas of concern.

- Prepare documentation regarding the determination of National Register of Historic Places eligibility of historic properties built during or before 1965 and that maintain integrity, and findings of effect regarding the same properties that are located in the post-LPA project footprint. This may require addressing historic built-environment properties that previously were previously directly or indirectly effected but the effects would be changed as a result of the modified project footprint based on the post-LPA design.
- Assist STATE's CRC Environmental Manager in consulting with the ACHP (in their role as a signatory) regarding the affected historic built-environment.
- Prepare a finding of effect for the I-5 bridge based on the post-LPA design and in support of the Section 106 and Section 4(f) process.
- Prepare text for the historic built-environment and cultural landscape elements of the MOA to resolve the CRC project's adverse effects on historic properties. This will require:
- Prepare for, coordinate, and facilitate coordination meetings with:
 - WSDOT historic built-environment specialists
 - ODOT historic built-environment specialists
 - DAHP historic built-environment specialists
 - SHPO historic built-environment specialists
 - NPS historic built-environment specialists
 - Appropriate Portland and Vancouver/Clark County governmental bodies with jurisdiction over cultural resource issues
- Assist environmental staff in preparing the historic built-environment portion of the FEIS.

Assumptions for 6.6.7

- WSDOT, ODOT, DAHP and SHPO will have agreed to findings of effect and the DEIS Technical Report findings and recommendations presented to them during the DEIS phase of the project.
- DAHP and/or SHPO will not require assessment of additional NR Criteria for Evaluation beyond those used during the DEIS.
- Consultant will give STATE addresses and STATE will secure Rights of Entry for all historic built-environment investigations.
- The post-LPA project footprint, within which direct physical impacts may occur, may include up to fifteen (15) acres previously not subjected to reconnaissance survey for (consideration of direct impacts to) historic built-environment resources. During the supplemental reconnaissance survey of this area, CONSULTANT and STATE expects that no additional built-environment resources will be identified that are over 50 years old and that will require DAHP or SHPO database forms. Consequently, no additional

DOE or FOE evaluations will be required for these historic built-environment investigations in these areas.

- CONSULTANT will provide up to eight (8) professional hours in facilitating STATE's consultation with the ACHP regarding the MOA.
- Other post-LPA refinements to CRC's construction and staging footprints may affect section 106 "effects" considerations for up to three (3) other National Register-eligible historic properties previously surveyed and evaluated.
- The STATES will invite the ACHP to participate in the NHPA section 106 process.
- No additional areas of the VNHR cultural landscape are expected to be affected by the post-LPA project footprint.
- The historic built-environment project element includes consideration of the cultural landscape of the VNHR Historic District. With STATES approval, CONSULTANT will coordinate with NPS cultural landscape specialists, and with CRC project's landscape and visual specialists to address project design compatibility with the cultural landscape, and to discuss possible mitigation measures to offset unavoidable adverse effects to cultural landscapes. CONSULTANT will not be required to provide a historic/cultural landscape specialist.
- The CONSULTANT will provide up to one (1) professional staff to attend project update and/or strategy meetings for up to:
 - Four (4) in-person, and two (2) by phone meetings with WSDOT in Vancouver, and two (2) in-person and two (2) by phone meetings with ODOT in Salem
 - Four (4) in-person and four (4) by phone, CRC cultural resources team meetings in Vancouver
 - Three (3) in-person and three (3) by phone, monthly meetings in Vancouver with the NPS
 - Two (2) in-person and three (3) by phone other meetings in Vancouver with DAHP or SHPO.
- The CONSULTANT will assign professional historic built-environment responsibilities for tasks only to persons who are qualified for the work under the Professional Standards of the Secretary of Interior, or state requirements, whichever is more stringent.
- All historic built-environment technical documents recording investigations, analyses, and recommendations will be prepared as a series supplementing the Historic Built-Environment Technical Report that was prepared to support the DEIS. The intent is to rely on previous documents in the series for background and reference information in order to reduce redundancy and paper consumption. Where appropriate, new series documents will incorporate and closely tie information that supplements or requires modifying underlying assumptions, interpretations, or assumptions contained in earlier documents within the series.

- Up to five reassessments of effects to historic built-environment resources (as affected by the post-LPA project footprint).
- Because of the discovery nature of historic built-environment resources, additional and as yet un-scoped and un-budgeted historic built-environment work may be necessary to complete the NEPA FEIS, ROD and/or Section 106 process (i.e., MOA). These efforts may be associated with, but not necessarily limited to:
 - DAHP and/or SHPO providing additional requests regarding the Historic Resources Technical Report, DAHP inventory forms, or DEIS that require additional assistance from CONSULTANT to the WSDOT and/or ODOT historic built-environment specialists in the consultations with the DAHP and/or SHPO, respectively.
 - DAHP and/or SHPO requiring assessment of additional NR Criteria for Evaluation than those used during the DEIS.
 - Potential discovery of additional historic built-environment properties needing investigation and/or assessed or reassessed for potential effects.

Deliverables for 6.6.7

In addition to the technical report, the CONSULTANT will provide:

- A finding of effect for the historic I-5 bridge to support the Section 106 and Section 4(f) processes.

6.6.8 Land Use

The CONSULTANT will update existing land uses adjacent to the proposed project corridor. The land use evaluation will address the LPA's impacts to local land use and compliance with local, regional, and state land use plans. The evaluation will also address development regulations that are applicable to this project, including allowed uses, special districts, and overlay zones. The analysis will identify the short-term impacts of construction based on an updated description of construction approach.

The analysis of long-term land use impacts will be based on comparing the LPA to the information collected on existing land uses, zoning, comprehensive plan designations, and up to seven designated special districts, overlays, and sub-area plans. The findings from other reports, such as Traffic, Displacements, Air Quality and others, will also help define land use impacts.

CONSULTANT will also complete a parking utilization study for areas where direct impacts include the displacement of on-street or off-street parking. The analysis will produce utilization data for peak and off-peak times, turnover in stalls, and the possibility of functionally replacing the displaced stalls.

The analysis of long-term land use impacts will also include a review for consistency and or compliance with state, regional, and local plans. Interviews with representatives from local jurisdictions and relevant agencies will be used to help resolve plan consistency issues, identifying any required inconsistency, the related changes needed to attain consistency, and initial estimates of the jurisdiction's willingness to accept such changes.

Further evaluation of impacts to land use will include an updated review of the literature and new modeling outputs regarding the possibility of induced growth, especially where it may be inconsistent with growth plans. The analysis of potential induced growth will include coordination with local agencies. Any iterative land-use/ transportation modeling would be provided by others (such as Metro). However, it would be conducted in coordination with CONSULTANT. The Technical Report will use information derived from any modeling, and from other analyses, to make final determinations of the potential for induced growth.

6.6.9 Neighborhoods and Populations

The Neighborhoods and Population technical report will analyze the following potential impacts: major displacements of people or community resources, separation of a neighborhood from its community resources, impacts to traffic circulation patterns, impacts on community cohesion, and inconsistencies with adopted neighborhood plan goals.

The scope does not include updating neighborhood profiles. It is assumed that the profiles provided for the Draft EIS will be adequate.

Any new or updated neighborhood and community plans will be reviewed to determine if the project is consistent with plans adopted by the City of Vancouver and the City of Portland. The findings from other reports, such as Land Use, Environmental Justice, Traffic, Transit, and Parks will also help identify impacts to Neighborhoods and Population.

6.6.10 Public Services

Public services include law enforcement, fire and emergency medical services (including hospitals), solid waste collection and disposal, federal post office service, and public school transportation. If needed, updated information for each public service will be gathered and analyzed within the primary API.

The CONSULTANT will collect updated information from existing facility and operations reports, available maps for route information, and interviews with representatives from public services. Existing reports and maps will provide the basic understanding of how public services function within the primary and secondary APIs. Interviews with public services representatives will provide the additional knowledge necessary to answer the key questions posed above. Where specific roadway or intersection forecast analysis is deemed necessary, this analysis will rely on data provided in the Traffic and Transportation Technical Report. In addition, project staff will evaluate land identified for potential future use as public service facility sites within the primary API to determine if any direct impacts to these sites would occur.

6.6.11 Parks and Recreation and Section 6(f)

The purpose of this work element is to refine the parks and recreation impacts assessments based on the post-LPA design footprint. The focus of the analysis will be on those parks and recreation resources that are:

- Publicly or privately owned

- Not primarily addressed in the Final Section 4(f) Evaluation, unless a park or recreational resource impact and mitigation is identified that is not covered by the Final Section 4(f) Evaluation (e.g., proximity impacts that do not cause substantial impairment to the resource but are important nonetheless). Based on the DEIS analysis, there are 13 public recreation facilities that because of their use, character or anticipated impacts, will not require analysis under Section 4(f). If affected by the LPA, and not subject to 4(f) evaluation, these will be covered in the Parks and Recreation section of the FEIS.
- Subject to Land and Water Conservation Fund Act, Section 6(f) conversion/replacement requirements, Oregon Local Government Grant Program (LGGP), Oregon County Opportunity Grant Program (COGP), Washington Interagency Committee for Outdoor Recreation (WICOR) program, and/or Salmon Recovery Funding Board (SRFB) program, each of which involve protection procedures similar to the LWCF Act.

The CONSULTANT will:

- Conduct and document in field notes limited supplemental field investigations to refine information.
- Coordinate with the CONSULTANT's Section 4(f) specialist regarding input from officials having jurisdiction over resources subject to Section 4(f) provisions, relative to the significance of the park or recreational resources, primary use(s) of the land or resource, optional mitigation measures and their effectiveness in reducing the impacts of use; coordinate with managers of other park or recreational resources not covered by Section 4(f)
- Coordinate with CONSULTANT engineering/design/management staff regarding developing feasible mitigation measures to be incorporated into the LPA design footprint and/or operational description (this will be used to coordinate with officials having jurisdiction and preparing the Evaluation).
- Prepare a Parks and Recreation Technical Memorandum that updates the Draft EIS Parks and Recreation Technical Report.

Assumptions for 6.6.11

- CONSULTANT will coordinate with up to three (3) local government agency officials managing parks and recreation resources not covered by the Section 4(f) work element.
- The CONSULTANT will not prepare any request for replacement report/letter regarding offsetting the potential acquisition of park or recreation land covered by LWCF Section 6(f), (LGGP), (COGP), (WICOR), and/or (SRFB) program protections. It is assumed that there will be no need for replacement land to offset acquisition of land covered by LWCF Section 6(f), (LGGP), (COGP), (WICOR), and/or (SRFB) program protections.

6.6.12 Visual Quality and Aesthetics

CONSULTANT will review the previously established visual limits for the project and define the inherently distinctive sub-areas in the project area by visiting the project area and using geographic information system maps. The analysis may identify a new study area based specifically on the proposed alignment of the locally preferred alternative. The CONSULTANT will then review who has views of the project and who has views from the project using project maps, understanding gained in the previous step, and by reviewing relevant planning documents.

The CONSULTANT will select final evaluation viewpoints in the project area and assess the views from the viewpoints as they existed before, and as they are likely to be after the project. Next, project staff will select views and viewpoints to be used for graphical simulations that illustrate likely changes due to the project. Lastly, project staff will describe the likely changes in visual quality that will result from the proposed alternatives.

The findings from other reports, such as Land Use, Neighborhoods, Parks and Recreation, Navigation and Aviation, and Cultural and Historic Resources will also help identify impacts to Visual Quality and Aesthetics.

Consultant will also analyze and address the following elements related to Visual and Aesthetic Impacts

- Project shadows and solar access blockage and the relationship of project shadows to the apparent mass of the project elements.
- The level of visual compatibility of the project elements to the landscape and built elements that compose the visual character of each landscape unit.
- Relationship to the street and landscape grid, and the character and texture (block size) of built and open space areas.
- Relationship to views of the shoreline and distant views from public places.
- Relationship of light and glare resulting from project lighting on viewers and activities in the surrounding landscape with particular reference to historic districts.
- Relationship to the planned context in National and City of Vancouver Historic Districts.
- Relationships to the Transportation Commission's Policy 6.3.6 to "protect and enhance the visual quality of Washington's transportation corridors and facilities" and "identify outstanding vistas visible from transportation corridors, then protect, restore, and enhance them."

Photographs of proposed new viewpoints existing conditions will be provided as part of this task. Coordination in preparation of visual simulations will address practicality and cost-effectiveness of simulations and consistency with project plans, other known projects and be coordinated with the design, public involvement, and urban design products. CONSULTANT will also analyze the River Crossing and Landside Aesthetics Assessment, specifically as it may dictate final design treatments that would have beneficial or adverse impacts under NEPA. A comprehensive set of

issues relating to architectural treatments will be addressed. A light and glare analysis will also be completed to satisfy Washington State SEPA requirements.

Assumptions for 6.6.12

Other tasks will provide photo-realistic visualizations. These views will include renderings of architectural features including the piers, other substructure details, and the deck and parapet features where visible. The views will also include transit stations/ park and rides. Though the simulations will be developed under other tasks, they will be coordinated with Task 6.6.12.

6.6.13 Hydrology and Water Quality

The Water Quality technical report will discuss the LPA as it applies to water quality and hydrology within the API. The report will evaluate impacts to floodplains, water quality, and stormwater conveyance and treatment based on the LPA design and updated storm water management system design developed in other tasks.

As part of a previous phase of work, studies and plans of local, state, and federal agencies were examined, and maps and GIS layers, including topography, soils, and floodplains, were reviewed. Water quality characterization studies, 303(d) and TMDL listings, and municipal water quality management plans were also reviewed, along with stormwater system infrastructure plans and capacity.

The updated technical report will analyze short- and long-term impacts to water quality and hydrology from the LPA. Potential long-term operational impacts on drainage systems and surface and ground water resources will be determined by analyzing and reviewing impacts to floodplains, stream shading, runoff quantity, water quality, and existing drainage system constraints. The technical report will determine potential short-term construction impacts by evaluating the impacts of demolition and construction activities of project elements on drainage systems and surface and ground water resources. Potential beneficial impacts of the proposed alternatives will also be evaluated. It is expected that one or more regulatory agencies will be especially concerned about copper and other metals in stormwater runoff. The team will update the literature review of copper-related avoidance and toxicity research and will coordinate closely with ODOT and WSDOT water quality technical staff. This report will be prepared in coordination with the CONSULTANT Engineering Team.

Assumptions for 6.6.13

The CONSULTANT Engineering Team will provide engineering and design-related information and analysis under other tasks, in support of the Hydrology and Water Quality report.

6.6.14 Wetlands

The Wetlands technical report will discuss the LPA as it applies to wetlands and jurisdictional waters that would be impacted by the LPA. The report will evaluate impacts to wetlands and jurisdictional waters and their designated buffers from project construction and long-term operation. A wetland delineation report will also be completed.

Data sources and data collection methodologies presented in this technical memorandum will be consistent with those described in the MDR. As part of a previous phase of work, the CONSULTANT Environmental Team has delineated, classified, and performed functional assessments on wetlands within the primary API. The same methods were used for wetlands in Washington and Oregon. The team has also conducted windshield surveys with limited field reconnaissance for wetlands within the secondary API.

The technical report will analyze short- and long-term impacts to wetlands and jurisdictional waters and their designated buffers. Maps of delineated wetland boundaries and protected wetlands and designated buffers will be used to determine sensitive areas that may be impacted by the project. The area of impacted wetlands and designated buffers relative to undisturbed wetlands within the APIs will be quantified, along with the area of high-quality wetlands and designated buffers impacted by the proposed alternative. Potential beneficial impacts of the proposed alternatives will also be evaluated and mitigation will be identified. Mitigation design drawings will be provided by another task.

6.6.15 Technical Report Production

The CONSULTANT will perform the editing, word-processing, and document coordination to develop the technical reports included under 6.6, as well as 6.7.

Assumptions for 6.6.15

Cost to print technical reports cannot be anticipated at this time and are not included in this scope of work. They will be paid directly by WSDOT.

6.6.16 Technical Report Oversight and Quality Control

CONSULTANT shall review and coordinate the environmental technical reports prepared by other subconsultants, including Air Quality (AF6031), Noise and Vibration (AF6032), Archaeology (AF6033) and Economics (AF6034). This oversight will focus on coordinating with those subconsultants on data needs, schedules and reporting. The technical analysis and validity will be the responsibility of the respective CONSULTANT preparing each report.

This task will also include quality control of the environmental technical reports prepared by CONSULTANT under 6.6, as well as review of the environmental technical reports prepared by others under 6.7. This quality control will comprise review by senior specialists in the respective disciplines of the technical reports, or by environmental generalists for accuracy and consistency within and between the technical reports.

6.7 Air Quality, Noise, Economics and Archaeological Technical Reports

Under this Task CONSULTANT shall prepare technical reports to support the FEIS for the following disciplines: Air Quality (AF6031), Archaeology (AF6033), Economics (AF6034), Noise and Vibration (AF6032).

Assumptions for Task 6.7

- The same assumptions listed under task 6.6 apply to this task.
- The technical validity and accuracy of the reports prepared in this task will be the responsibility of the respective contractor preparing each report.

6.7.1 Air Quality Report and FEIS Support

The Air Quality Technical Report will document project conformity by verifying that the project is included in Metro's conforming RTP and TIP with the same design concept and scope as the LPA. CO hot spots will be analyzed quantitatively at a maximum of six intersections (3 in Vancouver and 3 in Portland) for the LPA only, for project conformity purposes. The project affected intersections will be ranked by performance (LOS and delay) and total entering volume for intersections with LOS D, E, and F, to select the worst performing for analysis.

Assumptions for 6.7.1

- The Air Quality report for the FEIS will use the same methods used for the DEIS analysis.
- Regional and subarea emissions estimates will be provided by Metro for CO, NO_x, VOC, PM₁₀, PM_{2.5}, and the six MSATs.
- The CO hot spot analysis will be performed for the year after opening and the design year.

Note: Budget for Work Element 6.7.2 is not included in Task AF and will be added later by amendment. Work Element 6.7.2 scope may also be amended pending negotiations on budget.

6.7.2 Archaeological Research, Reporting and FEIS Support

Because most archaeological resources are buried and veiled, archaeological investigation decisions are necessarily phased to first implement a set of techniques to discover if archaeological sites are present, and to secondly, based on the limited understanding of conditions surrounding discovered sites, apply a refined set of techniques to determine the boundary and evaluate the significance of the sites. The appropriate techniques and level of effort required for each phase of investigation substantially relies on the results of the previous phase. This sequentially informative process affects the decreasing levels of certainty regarding anticipated activities and levels of effort required to conduct those activities as the project moves from site discovery to the site evaluation phases and beyond.

The purpose of this work element is to continue, in accordance with the National Historic Preservation Act (NHPA) and its primary implementing regulations found in 36 CFR 800, the process of identifying, evaluating the historic significance, assessing the effects, and resolving adverse effects to archaeological resources that may be affected by the CRC project.

This work element addresses responsibilities for the Field Archaeology CONSULTANT (HRA), as overseen by the CONSULTANT's Cultural Resources Manager (Parametrix).

The Field Archaeology CONSULTANT during the archaeological resources identification, site evaluation, and effects assessment elements of the CRC project will:

- Coordinate through STATEs environmental manager and/or the CRC tribal liaison with WSDOT, ODOT, Washington and Oregon SHPOs, National Park Service, U.S. Army Reserve, cities of Portland and Vancouver, and the eight (8) federally recognized and one (1) project-recognized consulting Indian tribes regarding their concerns regarding the project (e.g., location and character of known and potential archaeological resources and the appropriate site identification, evaluation, significance assessment considerations).
- Coordinate with the NPS, which will be conducting archaeological investigations within the VNHR.
- Assist, but not serve as Principal Investigator, with NPS's GPR investigations on the VNHR.
- Continue consultation, within the limitations of the budget, with recognized experts, including Dr. Stephen Dow Beckham and Dr. Curt Peterson, regarding historical and geomorphological issues, respectively.
- Per direction from STATE, incorporate new and relevant information into Research Design, permit applications, and/or technical documents:
 - Supplementary information on known and potential prehistoric and historic archaeological resources that are subject to the NHPA and are located in the project APE or general vicinity. This will include applicable information obtained from oral histories being conducted with various consulting Indian tribes, or information from other concurrent archaeological resources, broader cultural resources, geomorphological, and/or historical studies occurring in the general CRC project vicinity.
 - New information from preliminary results documentation or final reports regarding CRC archaeological, historic built-environment, and/or design/engineering detail.
 - Appropriate modifications to research questions and field method stipulations, guidelines, or protocols based on information obtained from activities identified above.
- As required to conduct field investigations, prepare and submit any needed amendments to Washington DAHP and/or Oregon SHPO archaeological permits.
- As requested by STATEs CRC project environmental manager, attend biweekly meetings with the project's cultural resources team, monthly meetings with the NPS, and other meetings with interested parties.
- Prepare cultural, faunal and floral materials for curation.

- The Field Archaeology CONSULTANT will attend project update and/or strategy meetings (assumed effort is described below in Assumptions) to inform other parties regarding the project progress, and/or to further refine the CRC archaeological program strategy. Meetings attended may be held by:
 - CRC Cultural Resources Team
 - CRC Project Management Team with the NPS
 - CRC Engineering, Design and Environmental Staff
 - Tribal governments or representatives

6.7.2.1 Archaeological Resources Discovery

Archaeological resources discovery investigations are conducted to determine the presence or absence of archaeological sites. The level of effort assumed is described in the Assumptions section below.

The Field Archaeology CONSULTANT will assist the CONSULTANT's Cultural Resources Manager in refining the boundary of the archaeological area of concern within the project's APE.

The Field Archaeology CONSULTANT will continue the process of archaeological resource identification initiated in the previous Task AD scope of work for Task 6.9.2. Activities will include the following:

- Field Investigations: Archaeological resource identification activities will include a combination of techniques that may include ground penetrating radar, pedestrian survey, subsurface trenching, shovel test probes, geocoring, monitoring or observing split-spoon samples of geotechnical drilling in accordance with a plan associated with this effort, and possibly opportunistic monitoring of other earth exposing construction activities in the project vicinity by other parties, and underwater survey (this last being a contingency).
- Coordinate with drillers regarding identification of archaeological resources, and monitoring of drilling.
- Direct collection of and analyze the samples from rotosonic drilling conducted to obtain archaeological discovery data and geomorphological information to support archaeological analysis.
- Prepare the following documents for the archaeological technical report series:
 - Up to a total of four (4) documents/manuscripts as part of the Archaeological Technical Report Series that may include one or more of the following:
 - Documentation of Archaeological Monitoring of Geotechnical Drilling
 - Preliminary and/or final assessment of ground penetrating radar archaeological investigations
 - Final assessment of pedestrian survey archaeological Investigations

- Preliminary and/or final assessment of roto sonic coring archaeological and associated geomorphological investigations
- Preliminary and/or final assessment of shovel probe, trenching and other archaeological subsurface resource discovery investigations
- Results of archaeological resource discovery
- A Comprehensive Archaeological Discovery and Testing Summary document is expected to be due in late November 2008 in order to be included in Finding of Effect Documentation, which is expected to be needed by January, 2009, and which in turn will inform the preparation of the MOA.
- For the duration of this Statement of Work, the following stipulations for in-field involvement by the Field Archaeology CONSULTANT's key professional archaeological personnel include:
 - Principal Investigator (PI) will:
 - Obtain from the Field Archeology CONSULTANT's Field Director, and document daily updates of the results and issues of field or laboratory investigations; obtain regular updates from the Laboratory Director
 - Provide weekly updates to the CONSULTANT's Cultural Resources Manager, and CRC-assigned WSDOT and ODOT archaeologists.
 - Be present in the field as needed, including:
 - During the start-up of each phase of field investigations
 - During investigation phase closure to confirm sufficiency of the investigations
 - During any investigations involving field-confirmed burial(s)
 - When WSDOT and/or ODOT or Consulting Party key personnel require their involvement to address issues associated with methodology, resource identification, or significance assessments (expected to occur no more than two [2] times)
 - Be the principal author of technical documents reporting the conduct, results, and recommendations regarding the investigations.
 - The Field Director will:
 - Provide aforementioned daily updates to the PI
 - Be present during all field investigations
 - The Laboratory Director will:
 - Provide aforementioned updates to the PI (at least every two [2] days)

- Be present during initiation of laboratory analysis phase, and regularly assess, and as needed correct analytical accuracy and consistency.

6.7.2.2 Archaeological Subsurface Testing and Significance Evaluation

The archaeological testing and significance evaluation phase is conducted to determine the physical boundaries of archaeological sites, and their significance based on applicable National Register Criteria for Evaluation (i.e., determine a site's eligibility for listing on the National Register of Historic Places, or in situations where archaeological resources are located within a NR District, whether the resources significantly contribute to the District).

The Field Archaeological CONSULTANT will conduct subsurface archaeological resource (testing) of sites identified during the discovery phase, will assess site significance, and will document results and recommendations regarding recorded archaeological sites that may be affected by the project. Field Archaeology CONSULTANT will:

- Employ a combination of excavation techniques that may include hand excavated test units/pits, backhoe excavated test units/pits (particularly for deep sites), hand augers, and/or additional (controlled shovel probes) to refine site boundaries. The techniques used at any given location will be based on coordination with and approval by AGENCY Environmental Manager or assigned agent of Environmental Manager.
- Coordinate with the CONSULTANT's Cultural Resources Manager and the NPS Field Archaeology CONSULTANT in mutually preparing a draft and final ,Comprehensive Archaeological Discovery and Testing Summary document as a manuscript of the Archaeological Technical Report Series. This document is expected to be due in late November 2008 in order to be included in Finding of Effect Documentation, which is expected to be needed by January, 2009 in order to support preparation of the FEIS and draft MOA.

6.7.2.3 FEIS Support

The Field Archaeology CONSULTANT will assist the CONSULTANT's Cultural Resources Manager, CRC Project Management Team, NPS, DAHP, SHPO, other section 106 consulting parties and potentially the ACHP in their developing the Memoranda of Agreement to resolve adverse effects to historic properties. Assistance includes attending meetings and reviewing up to one (1) draft of an MOA.

The Field Archaeology CONSULTANT will assist the CRC Environmental Team in their preparing the FEIS, by reviewing the archaeological element of one (1) draft of the document.

Assumptions for 6.7.2

Work Element-Wide Assumptions

- Field Archaeology CONSULTANT will provide CONSULTANT with mapped information showing properties for which Rights of Entry are needed;
- CONSULTANT will provide STATE addresses of properties for which Rights of Entry are needed; and, STATES will secure Rights of Entry for all archaeological resource

investigations, and provide Field Archaeology CONSULTANT with the documentation.

- No archaeological excavations will be conducted using water-screening techniques.
- Post-LPA refinements to the project alignment and facilities design, newly proposed stormwater collection/treatment facilities, wetland mitigation sites, and staging areas are expected to include up to fifteen (15) acres of land lying beyond the areas within which direct impacts were assessed for the DEIS and/or the CRC project's DEIS APE. No archaeological sites will be identified within this additional impact area.
- Refinements to the CRC project APE's archaeological area of concern, which is contained within the APE, will not require reinitiation of the APE concurrence process, or additional archaeological background research, but will require Field Archaeology CONSULTANT's assistance to CONSULTANT's Cultural Resources Manager to write the notification and explanation of the refinement to section 106 consulting parties. All consulting parties will agree with the refinements to the APE and its areas of concern.
- Field Archaeology CONSULTANT's Principal Investigator will attend one (1) meeting with CONSULTANT's Cultural Resources Manager, CRC engineering, design and environmental planning staff to consider avoidance and minimization measures based on archaeological data.
- Either the STATE's or the Prime CONSULTANT (DEA) will be responsible for identifying and contracting with a professional firm capable of conducting geo-core drilling/coring within the CRC schedule.
- Archaeological field investigations will require involvement by Archaeological Field Archaeologist CONSULTANT staff trained and certified to identify or handle hazardous materials. However, no hazardous materials will be encountered during any element of the archaeological investigations, and no contaminant sampling screening will be required by CONSULTANT in support of archaeological investigations and no direct IDW segregation and storage will be required.
- Field Archaeology CONSULTANT will prepare up to five (5) state agency or other local governmental archaeological permits for testing.
- Field Archaeology CONSULTANT will not be required to prepare any ARPA permits.
- The Field Archaeology CONSULTANT will conduct no further research at the National Archive Facilities in Washington D.C., and no new research at the National Archive Facilities in Seattle or at the HBC archives in Canada.
- During field investigations, the Field Archaeology CONSULTANT will collect and curate cultural material in accordance to the Research Design Plan and archaeology permit stipulations.
- The Field Archaeology CONSULTANT will assign professional archaeological responsibilities for tasks only to persons who are qualified for the work under the

Professional Standards of the Secretary of Interior, or state requirements, whichever is more stringent.

- Archaeological site significance determinations for each site will be based on considering the “National Register Criteria for Evaluation” Criterion D. The DAHP and SHPO will not require Field Archaeological CONSULTANT to consider Criteria A, B, or C of the National Register Criteria for Evaluation Criteria..
- The Field Archaeology CONSULTANT will provide up to two (2) professional staff to attend meetings in person and by telephone for up to a total of:
 - Four (4) meetings in Vancouver for review of archaeological resources identification and site discovery evaluation results
 - One (1) strategy meeting in Vancouver for archaeological discovery and testing with the CRC Cultural Resources Team, interested Tribes (coordinated with the CRC Tribal Liaison), and CRC STATES environmental manager, .
 - One (1) meeting in Vancouver with Cultural Resources Team to discuss the Research Deign Plan refinements.
 - One (1) van tour to discuss location of proposed fieldwork or status of the project
 - Three (3) inter-tribal meetings in Vancouver as requested by the STATES
 - Two (2) meetings in Vancouver for review of archaeological testing evaluations results.
 - Thirty (30) bi-weekly Cultural Resources team meetings, sixteen (15) of which will be held in Vancouver, and the other sixteen (15) will be held by telephone conference call.
 - 30 bi-weekly NPS/CRC meetings in Vancouver, sixteen (15) of which CONSULTANT will attend in Vancouver, and the other sixteen (15) will be held by telephone conference call.
 - Four (4) meetings with section 106 consulting Indian tribes, at their headquarters to summarize the field investigations prior to the issuance of the FEIS (and will be responsible for preparing one PowerPoint presentation)
- The APE will contain no traditional cultural properties of archaeological nature.
- No cases of human skeletal or funerary artifactual remains will be discovered; no exhumation of skeletal remains will be conducted, and all work will cease in the area of the discovery of human skeletal or funerary artifactual remains, in accordance with the CRC Inadvertent Discovery Plan. The Field Archaeology CONSULTANT will engage in no further initiation of any work associated with addressing the NAGPRA regulations as well Washington State Law 27.44 RCW and Oregon Revised Statutes 97.740-97.760.
- Analytical methods not considered for this Statement of Work include:
 - Flotation
 - Fine screening/sorting

- During archaeological subsurface investigations, the Field Archaeology CONSULTANT will typically mechanically remove modern fill/overburden originating from off-APE areas, or significantly disturbed soil matrices. Prior to removing these matrices, their vertical and horizontal extent and nature will need to be documented by reference to sources of information such as construction documents, aerial photographs, etc. Spatial context of potential artifacts and features within the matrix in significantly disturbed areas must be disrupted to the extent that their collection would not allow them being used to address any pertinent research questions. Care will be taken in excavating when approaching probable native or relatively undisturbed soil matrices, at which time controlled archaeological excavation techniques further defined in this scope will be implemented to excavate further.
- All archaeological technical documents recording the archaeological investigations, analyses, and recommendations will be prepared as a volume series supplementing the Archaeological Technical Report that was prepared to support the DEIS. The intent is to rely on previous documents in the series for background and reference information in order to reduce redundancy and paper consumption. Where appropriate, new series documents will incorporate and closely tie information that supplements or requires modifying underlying assumptions, interpretations, or assumptions contained in earlier documents within the series.
- Up to 10 cubic feet of packaged cultural, faunal and floral materials for Oregon and 15 cubic feet of packaged cultural, faunal and floral materials for Washington will be delivered to approved curatorial facility(ies), expected to minimally include the Oregon Museum of Cultural and Natural History, and the National Park System's Fort Vancouver National Historic Site curatorial facility.
- Archaeological resource field identification methods will be based on methodological stipulations, guidelines and/or protocols identified in the Research Design Plan, applicable permit applications, and on iterative coordination with appropriate section 106 consulting parties as new information is obtained.

Primary Archaeological Resource Discovery Methods Assumptions

- GPR – Primarily used in areas potentially including subsurface cultural features such as grave shafts, privy pits, or, building foundations, this method is expected to be used primarily within the Fort Vancouver National Historic Reserve (VNHR), National Historic Site, or National Register Historic District and in the old downtown Vancouver portion of the project (e.g., focused within the SR-14 interchange area, but not including paved roadway surfaces). The intent of using GPR is to identify potential subsurface anomalies that may be culturally derived, and to focus further subsurface identification investigations toward these anomalies. Much of the GPR work is being completed under an existing work order (AD). The amount that would be performed under a new work order will depend on the progress-to-date at the time the new work order is approved. It may include up to 20-days of effort for up to three (3) GPR-team professionals. The division of this effort between work orders will be coordinated with the STATE.

- Pedestrian survey – Given the exceptionally modified surface landscape, the pedestrian survey is expected to involve archaeologists opportunistically observing, in conjunction with other discovery activities, exposed areas and characterizing the extent and nature of anthropogenic landscape modifications within the APE than a systematic observation using evenly spaced transects. Much of the pedestrian survey is being completed under an existing work order (AD). The amount that would be performed under a new work order will depend on the progress-to-date at the time the new work order is approved. It may include pedestrian survey on up to 20 acres.
- Trenching – Mechanical (backhoe) trenching has been identified as the preferred identification method, particularly in areas with modern fill layers, or in areas with potential for containing archaeological remains in relatively deep strata extending down to about 8 – 10 feet below ground surface. Mechanical trenching will likely include one-foot to three-foot-wide backhoe buckets, potentially extending up to approximately 8-10 feet deep, depending on local site conditions. Trenching may include horizontal continuous trenches, or “identification probes/pits” at intervals, depending on local site conditions. Except when excavating through modern fill/overburden, apparent culturally-sterile sediments, or significantly disturbed soil matrices, trenches shall be excavated in approximately 20-cm vertical control levels, and soils from the trench will be collected and deposited so that they can be referenced back to an area approximately no larger than the equivalent of a 1 x 2 x .20 m unit. One sample consisting of approximately one hand-shovel full of soil from the equivalent of a backhoe bucket will be screened through ¼-inch hardware mesh in sediments potentially containing cultural materials. Up to approximately two (2) cubic meters of soil will be screened during trench investigations.
- Cylindrical shovel test probes (STPs) and/or (supplemental) hand-auguring – may be more appropriate in more sensitive and less disturbed areas. Each cylindrical STP shall:
 - Measure 30 cm in diameter;
 - Be excavated with a hand-shovel and/or trowel to either sterile, mineral soil or to a minimum depth of approximately 50 cm (unless bedrock or other impenetrable object/soil is encountered)
 - Further excavated using a 25 cm diameter bucket-auger probe to a maximum of 2.5 meters (unless bedrock/mineral soil or other impenetrable object/soil is encountered) when background research and/or on-site observance of soil matrices suggest buried cultural deposits may lie deeper.
 - Be excavated and recorded in vertical control levels not exceeding 10 cm
 - Be excavated at a 20 meter interval along transects spaced a maximum of 20 meters apart unless STATES, in consultation with appropriate section 106 consulting parties, agrees that background research and/or field conditions warrant different excavation spacing parameters, and provided the methodological changes can be accommodated within this Statement of Work’s budget.
 - Involve screening up to approximately ten (ten) cubic meters of soil matrix potentially containing historic cultural materials using 1/8-inch hardware mesh (may

- be nested with ¼-inch hardware mesh); matrix from obvious modern fill material will not be screened, with parameters defining “obvious modern fill” being provided in the Research Design and/or permits prior to initiation of STP excavations).
- Will not include archaeological discovery investigations at the Clark Public Utility property in Vancouver, Washington, and at the Port of Portland property(ies) located north and east of the Vanport wetlands and west of I-5.
 - Be terminated if the professional on-site archaeologist determines that enough cultural material has been encountered to warrant identification of a probable archaeological site and that further excavations would be more intrusive to site integrity than would test excavations.
 - Rotosonic geocoring – Particularly appropriate for deep-site identification and morphostratigraphic delineations, rotosonic geocoring will involve sampling soil matrices primarily underlying locations where proposed project features such as bridge piers, sheet pilings, and retaining walls requiring deep foundations may disrupt deeply buried soil matrices with a relatively high probability of containing archaeological materials and/or paleosols. The rotosonic geocoring plan developed during the previous work order will be used to guide the effort that will involve up to a total of three (3) rotosonic geocores. Because of limited sample size and potential for disturbance to archaeological resources, any rotosonic geocore will not be terminated should artifacts be discovered, but may be terminated if human remains are observed during the course of the drill-core.
 - Up to 25 rotosonic geocore sediment samples will be collected for detailed sediment physical and/or chemical composition analysis and/or future referencing, and will be curated at Portland State University. Up to 25 mass spectrometric analyses will be conducted, with results included in the archaeological technical report series, and up to five (5) samples for thermo luminescence analyses (one or more of these samples may be obtained from other subsurface investigation techniques).
 - Up to 10 samples of organic material will be collected for radio-carbon (C14) dating. The full length of all geocores will be:
 - Physically observed for evidence of archaeological materials/features, and for morphostratigraphic data that could better inform the geomorphological characterization (especially strata age) of the area.
 - Digitally photographed or video taped to document stratigraphic sequencing for future referencing and storage at Portland State University.
 - Geocore drilling/coring will not be conducted in known cemetery locations or in existing water bodies.
 - No Field Archaeology CONSULTANT will be required to collect, analyze or handle hazardous materials (this will be conducted by trained geo-tech drillers).

Additional Identification Methods

- Monitoring geotechnical drilling – in accordance with the previously developed archaeological monitoring plan associated with the geotechnical drilling plan. This will involve in-field observance of split-spoon samples of up to eight (8) geotechnical drilling sites in Washington, and (in-lab) observance of split-spoon samples from up to 25 other geotechnical drilling locations.
- Opportunistically monitoring ground-disturbing activities being conducted in the project by other parties, to obtain contextual information.
- Preparing and submitting Oregon or Washington SHPO or DAHP archaeological site forms documenting up to eight (8) new archaeological sites discovered
- During discovery phase, up to 500 pre-contact or historic-period artifacts (depositional age of at least 50-years old) will be collected, analyzed, and curated.
- Data analysis will include (but not necessarily be limited to):
 - Artifact/feature material type, style, functional and technical classifications, and discernable dates of deposition/manufacture
 - Faunal or floral materials
 - Spatial parameters (vertical and horizontal distributions and/or concentrations) of the remains, and association with stratigraphic levels.

Archaeological Significance Evaluation (Subsurface Testing and Analysis) Methods Assumptions

- Archaeological subsurface testing is expected to involve:
 - Test excavations of up to eight (8) archaeological sites ,
 - Excavating:
 - Up to forty (40) cubic meters of soil, excavated manually using primarily shovels, trowels or hand bucket-auger.
 - Up to one-hundred and fifty (150) cubic meters of soils will be excavated mechanically using a backhoe
 - Up to an average of 3,000 artifacts per archaeological site, or up to a total of 24,000 artifacts (which may include soil samples) will be collected and analyzed.
 - Up to twenty-five (25) samples of organic material for accelerator radio-carbon (C14) dating.
- Prior to initiating a test excavation, the Field Archaeological CONSULTANT will inform CRC Environmental Manager (and include in appropriate archaeological permitting documentation) about the anticipated soil volumes and the types and volumes (range) of artifacts anticipated to be excavated and discovered. The Field Archaeology CONSULTANT's Field Director will track approximate soil volumes, artifact counts and types by site and by cumulative excavations as the overall testing program proceeds. The Field Archaeology CONSULTANT's PI will notify STATES if the soil volumes, counts and/or types at each site are substantially different than

anticipated. Once approximately 75 percent of the total soil volumes and artifact counts are reached, the Field Archaeology CONSULTANT's PI, in consultation with the CONSULTANT's Cultural Resources Manager, will assess if additional effort will likely be needed to complete testing, and contingency funds will be needed.

- Square test units/pits excavations will:
 - Be excavated primarily using a hand-shovel and/or trowel
 - Will measure horizontally a minimum 50 x 50 cm
 - Extend a minimum of 50 cm (unless bedrock/mineral soils or other impenetrable object/soil is encountered). If cultural materials are encountered at or below 50 cm, excavations should extend through at least two (2) culturally sterile levels before being terminated. Bucket augers (25-cm diameter bucket) will be used to extend up to 2.5 meters below test unit/pit floor, unless bedrock/mineral soils or other impenetrable object/soil is encountered or two culturally sterile vertical levels are encountered.
 - Be excavated in vertical control levels not exceeding 10 cm
 - Involve screening soil matrix potentially containing historic cultural materials using 1/8-inch hardware mesh (may be nested with 1/4-inch hardware mesh); matrix from obvious modern fill material will not be screened, with parameters defining "obvious modern fill" being provided in the Research Design and/or permits prior to initiation of STP excavations).
- Mechanical trenching may be used in situations requiring removal of modern fill/overburden. When noted in a Research Design that had been reviewed by section 106 consulting parties or in an archaeological permit, native or relatively undisturbed soil matrices may be removed using up to one-foot-wide backhoe buckets. The intent of such excavations will typically be to allow broad exposure of complex stratigraphy and/or the depositional associations and relationships between artifact concentrations/features (to ultimately aid in identifying site boundaries and character for evaluating site significance, assessing effects of the project, and informing the development of potential mitigation options). It may also be used when site conditions do not allow opening test units for safe manual excavation of sites potentially extending to 8 – 10 feet below ground surface. Sampling excavated soils will minimally follow the protocol identified above for archaeological resource identification trenching, except that soil will be screened through 1/8-inch hardware mesh (may be nested with 1/4-inch hardware mesh). Trenching will be locally terminated if substantial artifact concentrations (indicating the presence of a focused activity area), or archaeological features are encountered.
- Data analysis will include as appropriate by artifact/feature type:
 - Artifact/feature material type, class, style (markings), dimensions functional and technical classifications, counts or weights (individually or grouped, as appropriate), and discernable dates and place of deposition/manufacture; this may include up to a total of:

- Fifty (50) X-ray trace element fluorescence analyses for material sourcing/characterization/fingerprinting (e.g., obsidian, brick/daub)
- Fifty (50) obsidian hydration rim measurement analyses for dating
- Faunal and floral identification (species, sex, age), taphonomic analysis
- Spatial analysis
- National Register Evaluation Criteria assessment pursuant to Criterion D
- A Comprehensive Archaeological Discovery and Testing Summary document is expected to be due in late November 2008 in order to be included in Finding of Effect Documentation, which is expected to be needed by January, 2009. As noted in Task 6.5, this schedule may be modified.
- STATES shall be responsible for:
 - All formal NHPA section 106 consultation with Indian tribes, SHPO, DAHP, Advisory Council on Historic Preservation, NPS, and other consulting parties or governmental agencies.
 - All payments to Indian tribes for their involvement in formal NHPA section 106
- Because of the buried nature of archaeological resources and the phased nature of archaeological investigations, additional un-scoped and unbudgeted work may be necessary to complete the NEPA FEIS, ROD and/or Section 106 process (i.e., MOA). This may require additional effort that cannot be precisely anticipated at this time and are not included in the budget. These efforts may be associated with, but not necessarily limited to an increase in the level of effort described above, including:
 - Increased intensity of archaeological discovery probing as may be required by the DAHP and/or SHPO.
 - Potential need (depending on overall project scheduling) to prepare additional drafts and final preliminary analysis and significance assessment of archaeological testing, to support development of the FEIS and draft MOA.
 - Potential need to secure support from additional archaeological specialists in order to address certain methodological and/or supply additional field-work and analytical expertise (e.g., wet sites or underwater archaeology, zooarchaeology, human osteology).
 - Potential need to organize, facilitate, attend and/or record additional meetings
 - Potential need to prepare and submit ARPA permit application(s), and/or additional archaeological testing permit applications.
 - Potential additional report reviews and/or review cycle steps.
 - Initiation of NAGPRA and need for the Field Archaeology CONSULTANT to support the coordination between participating parties

- Potential additional staff time in order to adequately assess the historical significance of archaeological sites
- Potential additional technical analysis.
- Potential inclement weather that may result in more time needed to conduct subsurface archaeological investigations.
- Unknown costs required to curate cultural materials at an approved curation facility.

Deliverables for 6.7.2

The CONSULTANT will provide:

- One (1) draft and final version of a Revised Research Design (AF6035)
- Up to five (5) technical documents/manuscripts for the Archaeology Technical Report Series, which may include the following (some may be combined or eliminated depending on timing of completion of field work relative to the FEIS and MOA schedule requirements): (AF6036)
 - Documentation of Archaeological Monitoring of Geotechnical Drilling
 - Preliminary Assessment of Ground Penetrating Radar Archaeological Investigations
 - Preliminary Assessment of Pedestrian Survey Archaeological Investigations
 - Preliminary Assessment of Geocoring Archaeological and Geomorphological Investigations
 - Preliminary Assessment of Shovel Test Probe, Trenching and other Archaeological Subsurface Resource Identification Investigations
 - Results of Archaeological Resource Identification
 - Preliminary Analyses and Significance Assessments of Archaeological Testing – intended to provide sufficient analyses, interpretations, and recommendations to allow prompt project decisions regarding next steps.
 - Comprehensive Archaeological Discovery and Testing Report

6.7.3 Economics Report and FEIS Support

The economic report addresses the economic impacts of the LPA and no build alternatives, including the identification of significant adverse impacts and beneficial effects on the local and regional economy. The report includes a discussion of both permanent and temporary (construction-related) impacts, as well as indirect and cumulative effects. The draft economics report has been prepared as part of the DEIS phase, and was developed consistent with the Economic Methods and Data Report.

During this phase, the economic impact analysis team will develop a final economics report, will provide support to the environmental and engineering team during the development of the FEIS, and prepare a supplemental analysis of the potential indirect economic effects of the project.

6.7.3.1 Final Economics Report

Section updates will be limited to changes in employment levels, construction of roadway facility and commercial development in the direct impact area, large-scale shifts in business uses along the corridors, and plans or policies adopted since the publication of the DEIS, as well as comments received on the DEIS. The quantitative analysis of displaced businesses, employees, and sales revenues performed for the DEIS will not be updated in the FEIS.

6.7.3.2 Support through FEIS

The economic impact analysis team will coordinate with the FEIS team with any relevant updates to the economics report. The team will provide support through the development of the FEIS, responding to questions and requests for information from the environmental team as appropriate.

6.7.3.3 Indirect Impact Analysis

A supplemental evaluation of indirect economic impacts of the project will be conducted to further identify, on a quantitative basis, the potential for induced residential and commercial development associated with the LPA. This evaluation will consist of the following:

- Identification of potential areas and conditions under which induced growth might occur, including an assessment of incompatibilities with adopted plans and policies; Establishment of methods to conduct a supplemental indirect impact analysis, which is assumed to consist of a land use model (such as Metroscope) to be conducted by Metro
- Development of findings.

Assumptions for 6.7.3

- Metro will conduct Metroscope modeling and provide findings to CONSULTANT.

Deliverables for 6.7.3

The CONSULTANT will provide:

- Final Economics technical report (AF6037)
- Final Indirect Land Use and Economics Impacts technical memorandum (AF6038)

6.7.4 Noise & Vibration Report and FEIS Support

The study approach is intended to meet the requirements of the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA). The analysis will traffic noise in Oregon and follow the Washington State Department of Transportation (WSDOT) *Traffic Noise Analysis and Abatement Policy and Procedures Manual* for Traffic noise in Washington State. CONSULTANT shall discuss the noise study with ODOT and WSDOT prior to commencing work.

6.7.4.1 Transit Noise and Vibration Analysis

- Perform a detailed noise and vibration analysis, as defined by the FTA, for a single mode of transit with:

- one river crossing;
- one alignment across Hayden Island
- one alignment in Downtown Vancouver
- one alignment in uptown Vancouver
- one terminus option.
- Project noise and vibration levels within 350 feet of the transit alignment and determine the location and severity of noise and vibration impacts.
- Provide noise and vibration mitigation measures, by station number, for all transit impacts, to included start and stop stations of proposed mitigation, estimated mitigation cost, mitigation type and updated noise and vibration levels with mitigation measures applied.
- Provide a construction noise analysis for the HCT alternatives as described above.

6.7.4.2 Traffic Noise Analysis

- Perform a traffic noise analysis using the appropriate standards (WSDOT in Washington State and ODOT in Oregon), assuming:
 - one river crossing
 - one mainline alternative from the north shore of the Columbia to SR-500
 - no noise impact or mitigation analysis north of NE 45th Street on I-5 in Vancouver or anywhere on SR-500
 - no major changes in the vertical or horizontal alignment of any local streets at distances greater than 300 feet from I-5.
- Project traffic noise using TNM version 2.5 (or newer if available) within 500 feet of the project roadways and determine the location and severity of traffic noise impacts.
- Examine traffic noise mitigation measures for traffic noise impacts along any project related modified roadways and compare the mitigation measures to the appropriate cost effectiveness and reasonability criteria. Mitigation meeting feasibility and reasonability requirements will be recommended for inclusion with the project. Mitigation details included start and stop stations of proposed mitigation, estimated mitigation cost, mitigation type and updated traffic noise levels with mitigation measures applied will be presented.
- Provide a construction noise analysis for the traffic alternatives as described above.

6.7.4.3 Noise and Vibration Technical Report

- A noise and vibration technical report will be prepared to meet the requirements of FTA, FHWA, ODOT, and WSDOT.
- The contents shall include land use in the area, existing noise conditions, analysis methods, impacts, and potential build noise mitigation measures.

- Mitigation cost estimates shall be included, and shall be based on recent construction costs in Oregon and Washington.
- The report shall include maps of the existing alignment, proposed alignments and noise monitoring and modeling locations for traffic noise and transit noise and vibration.
- Comparative tables shall be prepared to aid in the understanding of project noise levels.
- Detailed construction noise and vibration analysis shall be performed.
- Up to two (2) reviews will be performed, one by the project team, and a second by State and Federal agencies. Based on the comments and reviews, a Final Noise and Vibration Technical report shall be produced.

6.7.4.4 FEIS Support

- A review of the EIS sections on noise and vibration will be performed as part of the analysis
- Assist the parks, 4(f), environmental justice and wildlife tasks with their sections as related to noise

Assumptions for 6.7.4

- No additional noise monitoring is proposed as part of this analysis
- No additional vibration measurements are proposed as part of this analysis
- The traffic noise will be re-modeled using 2035 traffic volumes, mixture and speeds
- Only the worst case traffic volumes under all tolling options and alternatives will be modeled
- Light rail noise and vibration levels will be remodeled using any new or revised data or alignment information.
- Only the worst case light rail volumes under all tolling options and alternatives will be modeled

6.7.4.5 Assumed Project Regulations:

- 23 CFR 772. 1982. FHWA, "Procedures for Abatement of Highway Traffic Noise and Construction Noise." US Code of Federal Regulations.
- FTA. April 1995. "Transit Noise and Vibration Impact Assessment, Final Report."
- ODOT. June 1996. Noise Manual.
- Oregon Administrative Rule (OAR) 340-35. Oregon Department of Environmental Quality (DEQ). "Noise Control Regulations." Oregon Administrative Rules.
- WSDOT. March 2006. "Environmental Procedures Manual, Chapter 446 (Noise)."
- WAC 173.60. "Maximum Allowable Noise Levels."

6.7.4.6 Assumed Project Data

- Transit noise levels will be projected using the methods for a detailed analysis as defined in the FTA Transit Noise and Vibration Manual, Revised 2006.
- Transit vibration levels will be projected using the methods for a detailed analysis as defined in the FTA Transit Noise and Vibration Manual, Revised 2006.
- Traffic-noise levels will be calculated using FHWA TNM Version 2.5.0, or newer if available (USDOT 1998).
- Input to the traffic noise models will include traffic volume and speed data generated by project traffic operations team. Noise emission levels used in the models are nationwide averages for automobiles, trucks. In addition to the traffic information, noise-reducing effects of existing structures located adjacent to the project roadway, roadway depressions, topography ground cover and foliage are included in the calculations where appropriate.

6.7.4.7 Data sources for the noise analysis include:

- Transit Data: To include number of trains per hour throughout the day on typical weekdays, speed contours for train service by station numbers, location of special track work, such as switches, type of track (embedded, at-grade, ballast and tie, elevated, retained cut, or tunnel) and assumes that the trains will be the same as the current fleet of Siemens Light Rail vehicles with wheel skirts currently in use by Tri-Met.
- Traffic Data: To include revised existing traffic volumes and future traffic volumes for each alternative (no-build and all build alternatives), to include percentages of passenger vehicles, medium trucks, heavy trucks and buses. Traffic volumes for the PM peak-vehicle hour and the PM peak-truck hour are required for Oregon traffic noise analysis. Projected travel speeds and posted speeds are also required for each alternative.
- Project Design Drawings: Updated detailed design drawings to model the transit alignments and roadways in the corridor along with all connector ramps and associated arterial streets within 500 feet of the near lane or curb along both sides of all new or modified project roadways. The design drawings must be electronic versions in AutoCAD or MicroStation. Recent aerial photos of the corridor are also requested and must be referenced in to work with the design drawings.
- Topographical Information (may use and update information from DEIS): Detailed topographical information for input to the noise model; this will include information such as berms, hillsides, depressed roads, existing structures, and any other topographical information that may affect the propagation of noise within 500 feet of the project corridor. In addition, any ground features that may be altered during construction will also be noted and used in the noise analysis.
- Ground Cover (may use and update information from DEIS): Ground cover between the noise source and receivers in the area for use in the noise model, obtained through a combination of aerial photos and site visits. Ground cover model inputs include pavement, water, grass, and foliage, such as evergreen trees, that will affect how the

noise propagates between the noise source and the receivers. In addition, any ground cover that may be altered during construction will also be noted and used in the noise analysis.

- Receiver Information (may use and update information from DEIS): The locations of all noise sensitive receivers within 500 feet of the project corridor. Receivers will be selected by on-site visits and with information from the Project Manager and Project Team Members.
- Land Use Planning: Updated detailed information on the existing land use within 500 feet of the project corridor.

Deliverables for 6.7.4

The CONSULTANT will provide:

- Final noise and vibration technical report (AF6032)

6.8 Final Section 4(f) Evaluation

The Final Section 4(f) Evaluation will update the analysis and preliminary conclusions included in the Draft Section 4(f) Evaluation that was part of the DEIS. The Final 4(f) Evaluation will:

- Revise descriptions of 4(f) resources as needed, based on comments received on the DEIS, or any updates regarding eligibility of historic resources.
- Update the descriptions of “use” of Section 4(f) public parks and recreation facilities and historic resources. The update will reflect the refined LPA design.
- Update the analysis of potential measures to minimize harm, including coordination with design staff to determine which potential measures are reasonable and can be incorporated into the LPA.
- Update and finalize any findings of *de minimus* impact.
- Update analysis and conclusions regarding the least harm alternative.
- Update the coordination with relevant agencies.

The purpose of this work element is to complete a Final Section 4(f) Evaluation for the project. The focus of the Section 4(f) evaluation will be on park, recreational area, and historic resources; the Evaluation will include confirmation that no wildlife refuges, or other types of resources protected by Section 4(f), would be affected by the project.

To promote compliance with Section 4(f) requirements, this Evaluation will require coordination with the Parks and Recreation, Historic Resources, Visual Quality and Aesthetics, and Archaeological analyses and technical reports for the project. The CONSULTANT will:

- Coordinate with these other elements of the project to obtain appropriate information regarding Section 4(f) resources to supplement or update information included in the Draft Section 4(f) Evaluation.

- Conduct and document in field notes limited supplemental field investigations to refine information.
- Coordinate and seek written documentation from officials having jurisdiction over resources subject to Section 4(f) provisions, relative to the significance of the land or historic resource, primary use(s) of the land or resource, minimization measures and their effectiveness at reducing the impacts of use, possible mitigation measures, and/or agreements regarding minimization measures. This will include coordination with the following officials having jurisdiction:
 - US National Park Service Fort Vancouver National Historic Site Supervisor
 - Washington Department of Archaeology and Historic Preservation
 - Oregon State Historic Preservation Office
 - Up to two (2) other local government agency officials or private parties owning and/or managing Section 4(f) resources.
- Official coordination with these parties will be arranged through STATE.
- Coordinate with CONSULTANT engineering/design/management staff regarding developing reasonable minimization measures to be incorporated into the LPA design footprint and/or operational description (this will be used to coordinate with officials having jurisdiction and preparing the Evaluation).
- Factor in consideration of the combined uses and de minimus uses in determining the least net harm to Section 4(f) resources.

Assumptions for 6.8:

- Assessment of magnitude of use for preparing the Evaluation will be based on a single LPA design footprint that has been developed by CRC after consideration of input from officials having jurisdiction regarding minimization and mitigation measures. Minimization measures will be incorporated into the design and therefore extensive evaluations of potential minimization measures will not be required in the 4(f) Evaluation.
- The project will result in a use of multiple recreational resources and/or historic properties, requiring assessment of least net harm to resources subject to Section 4(f) provisions.
- CONSULTANT will attend up to three (3) meetings with the aforementioned officials having jurisdiction over one or more Section 4(f) resources affected by the project.
- The Final Section 4(f) Evaluation will be incorporated into, and published as a chapter in the FEIS and will involve:
 - No avoidance alternatives
 - Up to twelve explanations of use (documenting assessment of avoidance and minimization)
 - Up to ten explanations and determinations of de minimus impact

- Up to three (3) explanations and determinations of “no constructive use”.
- Up to five (5) explanations and determinations of “temporary occupancy,” including documented agreement from the official(s) having jurisdiction over the resource regarding the determination
- No traditional cultural, archaeological, or cemetery identified either as section 106 historic properties or as having primary recreational importance, are expected to be identified or addressed in the Evaluation.
- No wildlife or waterfowl refuge has been identified, or is expected to be located in the project area.
- Consultant will organize and facilitate up to one (1) Cultural Resources/Section 4(f) Work Group meeting to discuss assessment of net least harm.
- STATES will lead the effort to acquire written documentation from officials with jurisdiction over 4(f) resources.

Deliverables for 6.8:

- Final Section 4(f) Evaluation. (AF6039)

6.9 Final Environmental Impact Statement

The Final Environmental Impact Statement (FEIS) shall update information in the Draft EIS, based on comments received on the Draft EIS, new information received, and design modifications or details associated with the LPA, including new information on existing conditions, impacts from the LPA and mitigation. The FEIS will include responses to comments on the Draft EIS. The FEIS will contain:

- An updated description of the Proposed Action and its environmental settings;
- A description of the comments received on the DEIS, and how the project has addressed this feedback;
- A statement of the environmental impacts of the LPA, including its short- and long-term effects, as well as indirect and cumulative effects;
- An identification of any adverse environmental effects that cannot be avoided if the Proposed Action is implemented;
- A description of mitigation measures to minimize adverse environmental impacts.

The FEIS will be written by a core group of authors within the environmental team. This is intended to keep the document in a single voice. The extent to which the FEIS will follow reader friendly principles is subject to approval by FHWA and FTA.

CONSULTANT will provide word processing, technical editing and document production for each draft of the FEIS.

Assumptions for 6.9

- The extent and complexity of comments that will be received on the Draft EIS, and will therefore require responses in the Final EIS, cannot be anticipated at this time. Additional budget may be required to manage and respond to comments, depending on the number and complexity of comments received.
- Budget for preparing responses to comments requiring input from consultant team members, other than the Environmental consultants (such as Engineering, Traffic, Transit or others), are not included in this task.
- STATE's will directly provide or directly pay for printing costs of the FEIS

Deliverables for 6.9

The CONSULTANT will provide:

- Four review drafts and one final version of the Final EIS. (AF6040)

6.10 Record of Decision

The CONSULTANT shall develop a draft and final Record of Decision. The ROD will identify the selected alternative, present the basis for the decision, identify all alternatives considered, identify the “environmentally preferable alternative”, provide information on any mitigation measures that will be incorporated into the project, and summarize the opportunities that the public had to comment during the NEPA process. The ROD will document any required section 4(f) approval and other regulatory compliance, as necessary.

Assumptions for 6.10

- There will be up to three review versions of a draft ROD prior to finalizing it.

Deliverables for 6.10

The CONSULTANT will provide:

- Record of Decision document (AF6041)

6.11 Geographic Information Systems Support

This task covers the GIS and data management work necessary to support all work conducted under Task 6.0 Environmental. This task also includes up to 10 hours per month for GIS staff from the environmental team to meet and coordinate with GIS and CAD staff from other members of the project team.

Assumptions for 6.11

- Spatial data for the designs to be analyzed in the technical reports and FEIS will be provided by others in an ESRI compatible file format in the project coordinate system.
- The budget for GIS support is not to exceed 1400 hours of work by a GIS Technician. This is assumed to provide approximately the following level of support in this task:

- NEPA Public Involvement Support
 - Prepare up to 30 map figures and 20 plots for public meetings and Community Outreach events.
 - Prepare up to 15 maps and figures for the Public Involvement Report.
- Engineering, Traffic and Transit Team Support
 - Conduct GIS analysis and provide map figures needed to support Engineering, Traffic, and Transit needs for technical reports, modeling efforts, design refinement, and technical analysis for the FEIS, not to exceed 20 map figures.
- Regulatory Agency Coordination and Compliance
 - Prepare up to 30 map figures and 10 plots for meetings with regulatory agency representatives.
- Technical Reports and FEIS Support
 - Conduct GIS analysis necessary for each discipline to complete its technical analysis for the FEIS.
 - Prepare up to 50 map figures for technical reports and FEIS.

6.12 Mitigation Plan

CONSULTANT shall develop a Mitigation Plan that includes all mitigation measures for each element of the environment. This document will identify and describe all measures for mitigating impacts identified in the FEIS for inclusion in the Record of Decision. These mitigation measures will also be coordinated with the development of a separate sustainability plan (prepared under a different task). CONSULTANT Environmental Manager together with STATE Environmental Manager will oversee the development of the sustainability plan and coordinate it with development of the mitigation plan.

Assumptions for 6.12

- Technical report authors will develop the initial list of mitigation measures for their respective elements.
- Finalizing mitigation measures for the mitigation plan will be developed in coordination with other team members, including the engineering team and project management.
- The engineering team will develop necessary mitigation drawings.
- Identification of sustainability goals and strategies and the content and delivery of the sustainability plan are covered under Task 6.14.

Deliverables for 6.12

The CONSULTANT will provide:

- Mitigation Plan (AF6042)

6.13 Permitting Support

Permitting support is limited to those activities necessary for the successful issuance of the Record of Decision as identified below. This is assumed to include only the Biological Assessment for ESA, related sediment evaluation and characterization, and EPA sole source aquifer approval. This assumption is subject to verification by the federal co-leads and cooperating agencies. This task excludes any other permitting support, including but not limited to permits or approvals related to impacts to California sea lions under the Marine Mammal Protection Act, to wetlands and jurisdictional waters, navigable waters including Section 9 or other approvals from the U.S. Coast Guard, FAA related approvals, Phase I Environmental Site Assessments, or approvals by any other federal, state or local jurisdictions.

6.13.1 ESA (Biological Assessment)

Endangered Species Act (ESA) compliance and documentation will require coordination among CRC, the STATES, transit agencies, FHWA, FTA, National Marine Fisheries Service, US Fish and Wildlife Service, and Tribes. Up to three meetings per month may occur with one or more of these entities between June 2008 and December 2008. Based on the outcomes of these meetings, the CONSULTANT will develop a biological assessment (BA) to address compliance with Section 7 of the ESA and Essential Fish Habitat under the Magnuson-Stevens Fishery Conservation and Management Act. The BA will be prepared for submittal by CRC as the FTA and FHWA representative for initiating consultation with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS). The BA will address baseline conditions and identify species listed as endangered, threatened, proposed, or candidate and their habitats that occur in the project area. The BA will also integrate activities needed under the Marine Mammal Protection Act for Steller sea lions. Analysis of impacts to listed species and their habitats will be completed. The BA will consist of one document, using the ODOT BA template as a base document, with specific WSDOT modules placed into the BA template where appropriate. After submittal of the BA, ongoing coordination with USFWS and NMFS will occur via phone and email correspondence to address questions and issues during their review of the BA, and up to one meeting a month may occur between the entities listed above between January 2009 and December 2009.

A final BA template will be prepared. Separate memoranda will be produced to address technical issues related to listed species and habitats, including stormwater treatment, underwater noise, and habitat enhancement. These memoranda will discuss the regulatory environment requiring addressing each issue and likely compliance scenarios. Additional meetings with natural resource groups and funding agencies, such as watershed councils, the Lower Columbia River Estuary Partnership, drainage districts, and cities may occur to identify habitat enhancement opportunities and methods.

Coordination with the engineering team to prepare project descriptions and “mitigation” measures will occur under Task 6.12 – Mitigation and Sustainability Plan.

Assumptions

- It is assumed that NMFS and/or USFWS will not find that the project would result in a determination of “jeopardy” for a listed or proposed species nor the adverse modification or destruction of designated critical habitat.
- Smelt (eulachon) may be proposed for listing in November 2008, with a listing decision finalized in November 2009. If necessary, an amendment to the BA will address impacts of the project to smelt and their habitat.
- Critical habitat for the southern distinct population segment of green sturgeon may be designated in the project area by November 2009. It is assumed that habitat enhancement identified in the submitted BA will result in no adverse modification or destruction of green sturgeon critical habitat.
- It is assumed that no more than one round of review for any agency is required for the BA template, BA, or other deliverables under this task.

Deliverables

- Final BA template (AF6043)
- Habitat enhancement technical memorandum (AF6042)
- Underwater noise technical memorandum (AF6043)
- Draft BA for serial review by: a) CRC; b) STATES, C-Tran and TriMet; c) FTA and FHWA; and d) Tribes
- Final BA for submittal by CRC as FTA and FHWA representatives to NMFS and USFWS (AF6044)
- BA amendment for smelt and designated critical habitat, if necessary (AF6045)
- BA amendment for southern DPS green sturgeon critical habitat, if necessary (AF6045)

6.13.2 EPA sole-source aquifer approval

The Vancouver portion of the project will occur within the area underlain by the Troutdale Sole Source Aquifer. Because groundwater and surface water resources may be impacted, review and approval of project impacts to the aquifer by the U.S. Environmental Protection Agency will need to occur. A draft request for review and approval of the project will be prepared for review by the project team. Final request for approval will be prepared after review by the STATES and FTA and FHWA for submittal to EPA.

Assumptions

- Negative impacts to the sole source aquifer will not occur.
- Coordination with the design team will be required to prepare the review and approval package.

Deliverables

- Draft request for approval for serial review by: a) CRC; b) STATES, C-Tran, and TriMet; and c) FTA and FHWA.
- Final request for approval for submittal to EPA (AF6046)

6.13.3 Sediment evaluation and characterization

To support the potential need for dredging and to satisfy likely requests from natural resource agencies, evaluation of sediments in the project area is expected to be required. CONSULTANT shall conduct the following activities:

- Project coordination and communication with STATES and applicable agencies.
- Review historic dredging information. Information may be used to help craft the SAP.
- Meet with the Regional Management Team (RMT) discussing sediment evaluation program.
- Prepare Sampling and Analysis Plan (SAP). The plan will be consistent with the 2006 Northwest Region Sediment Evaluation Framework (SEF).
- Project coordination and communications with coring platform, drilling and laboratory service providers.
- Mobilize/Demobilize field equipment.
- Collect up to 10 sediment core to a depth of 10 feet below river bottom.
- Collect up to 4 discrete sediment samples per core. Samples will be either submitted for laboratory analysis or archived.
- Conduct laboratory and sampling platform coordination and sample transferring.
- Analyze sediment samples for SEF standards.
- Perform laboratory data quality review.
- Prepare Sediment Characterization and Evaluation Report.
- Input data into Ecology's SEDQUAL database.

Assumptions

- Up to two meetings with the RMT.
- Investigation derived wastes (IDW) generated from the sediment evaluation program will be managed by procedures outlined in the SAP.
- Field work schedule will be dependent on coring contractor and coring platform operator availability.
- Coring will be conducted using a vibracoring drilling technique.
- Contracting for sample analysis, drilling services, and coring platform will be conducted by others.

- Contractors will be responsible for their own HASP.
- Core locations will be located and mapped using a geographic positioning system (GPS). The effort will utilize existing survey control points as a datum. Survey data will be input into the project base map.
- The number and type of chemicals and characteristics to be analyzed will be consistent with the current SEF.
- Sediment samples will be analyzed for conventionals (e.g. grain size, total volatile solids, total organic carbon), volatile organic compounds, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, metals, sulfides, and pesticides.
- Tier III biological testing will not be required.
- Prepare up to 10 copies of one draft and one final Sediment Characterization and Evaluation Report.

Deliverables

- Draft and Final Sampling and Analysis Plan (SAP) (AF6047)
- Draft and Final Quality Assurance Project Plan (QAPP) (AF6048)
- Draft and Final Health and Safety Plan (HASP) (AF6049)
- Draft and Final Sediment Characterization and Evaluation Report. (AF6050)

6.14 Sustainability Plan

The CONSULTANT will provide oversight and contribute to the development of a project Sustainability Plan, including coordination with other environmental tasks such as data collection, impact analysis, regulatory agency coordination, regulatory compliance, mitigation development, and the development of the FEIS and ROD. This will include providing input to and review of sustainability frameworks, principles and goals, opportunities and strategies, as well as participating in relevant sustainability related meetings to promote coordination and consistency across tasks that address environmental objectives, regulatory compliance, and environmental mitigation or enhancement.

This work is a continuation of Task AD work element 6.13. Background is provided following the numbered task descriptions.

6.14.1 Sustainability Coordination.

This Task provides for coordination with the project team to advance the sustainability program. There are two coordination efforts envisioned by this task. The first is coordination with internal and/or external working groups. Internal coordination will be among project team leads that are responsible for ensuring that information regarding the sustainability program is disseminated among the project team members. The external working group will either consist of sharing information from the existing project working groups or creating a new sustainability working group. If there is a separate sustainability working group, the members will be determined by the STATE's Environmental Project Manager. The second coordination effort envisioned is

regularly scheduled coordination meetings. These meetings will include the CONSULTANT and STATE Environmental Project Manager, and others as needed including members of the working group. These meetings will be focused on achieving a more sustainable project during the design and future project phases.

6.14.2 Comparing Sustainability Goals with Project Plan, Design and Permit Mitigation

The CONSULTANT will compare the sustainability goals identified by the internal and/or external sustainability working group with the project plans, design, and mitigation measures identified for project permitting. A “gap analysis” will be performed to identify areas where sustainability goals are not likely to be met as envisioned by the working groups. Additionally, areas will be noted where the project meets or exceeds the goals of the sustainability working groups. This information will be organized in a matrix and used to target work in Task 6.14.3 *Identify Opportunities and Strategies*.

6.14.3 Identify Opportunities and Strategies

The CONSULTANT will lead the internal and/or external sustainability working groups or appointed design team through a workshop or set of work sessions to identify opportunities to achieve the sustainability goals and objectives identified in Task AD. The workshops or work sessions will be developed with the underlying principle that the designers know their subject best, and with some guidance, are the best ones to improve the sustainability of the project. The CONSULTANT will provide examples and experiences of other projects, and bring in professionals from the field to share experiences that will inspire and inform. Participants will be encouraged to innovate, and each idea will be screened for benefits, value, and other factors as determined by the working groups. Background materials will include the vision and goals developed previously by the working groups, the matrix from task 6.14.2, and any design-related materials needed to support discussions.

Deliverables:

- Meeting agendas and tracking of meeting action items (AF6051)
- Workshop Summary Document(s) (AF6052)
- Opportunities Matrix, Cost/Benefit Assess (AF6053)

6.14.4 Implementation of Sustainability Strategies

The CONSULTANT will lead the effort to develop the Implementation Plan for the sustainability strategies identified in Task 6.14.3. The Implementation Plan will include the design, construction, operations, maintenance and end-of-life phases for each strategy, as appropriate. This task includes that the CONSULTANT stay current on state-of-the-practice for sustainability indicator research. In particular, the Transportation Research Board is currently developing a toolkit of indicators. The CONSULTANT will take responsibility to stay abreast of this and other leading research efforts related to sustainability indicators so that the state of the art is applied to project practices.

Deliverables:

- Implementation Matrix (AF6054)

6.14.5 Sustainability Plan

The CONSULTANT will prepare the Sustainability Plan for the Columbia River Crossing Project. The document will include an introduction, the projects sustainability vision, goals and objectives, the opportunities and strategies matrix, the implementation plan, and a summary of the Working Group's activities. Graphics, tables and figures will be used to aid in the presentation of information.

Deliverables:

- Draft and final Sustainability Plan (AF6055)

7.0 TRANSIT PLANNING AND ENGINEERING

The purpose of this task is to advance the Columbia River Crossing Locally Preferred Transit Alternative through the Preliminary Engineering (PE) and Final Environmental Impact Statement (FEIS) phase until issuance of the Record of Decision (ROD). Major elements of the task are:

- 1) Satisfy the FTA New Starts process and submit an application for a FY2010 New Starts project rating on 8-14-08;
- 2) submit an FTA application to enter preliminary engineering;
- 3) complete advanced conceptual engineering and preliminary engineering on the transit project, and
- 4) support agencies and other CRC task managers to complete the requirements of the FEIS.

This phase of the work will focus on further refinement of transit alignment and project characteristics through preliminary engineering to a design detail sufficient to minimize the likelihood of significant cost overruns or unanticipated impacts or design changes, and advancement of the transit elements of the project through the FTA New Starts rating process. The timeframe for these services is from September 1, 2008 through December 31, 2009.

At the conclusion of preliminary engineering, this scope will also include preparation of materials necessary to prepare for application to enter the Final Design phase.

To accomplish these elements, the transit planning and engineering task is broken down into 13 subtasks, which are listed below. Significant assumptions and deliverables are listed under each subtask. The work will focus on the transit LPA alternative, as well as design options that might remain after the LPA decision is made.

Task 7.0 Assumptions:

- CONSULTANT staff for transit has been limited by hours included in the approved Task AF Budget. STATES or Agencies directing the CONSULTANT team may elect to self-perform portions of the following work elements as determined by the STATES or Agencies. Requests for CONSULTANT services or staff beyond hours shown in the approved budget will be considered extra services.

7.1 Transit Team Management and Quality Control

The CONSULTANT will manage all individual work elements related to transit planning and engineering performed by consultants, participate and collaborate with other task managers on related work items, work together with agency staff and oversee progress reporting. Monthly progress reports shall be developed and the TEAM will attend up to 35 project development team meetings. The TEAM will adhere to the CRC quality plan. Activities under this subtask include:

- Task implementation
- Attend bi-weekly Highway-Transit-Traffic team meetings (35)
- Monthly progress reports (16)
- Attend bi-weekly TM (Task Manager) meetings (35)
- Attend bi-weekly New Starts Working Group meetings (up to 35)
- Attend bi-weekly Transit Design Coordination Group meetings, as needed (up to 35)
- Attend Bi - Weekly Transit Technical Advisory Group meetings (up to 35)
- Provide periodic Quality Control plan updates (up to 2)
- Establish and maintain a continuing Quality Control program
- Provide Quality Assurance Oversight
- Attend bi-weekly coordination meetings with City of Vancouver
- Provide monthly project schedule updates (16)
- Attend review meetings with FTA Project Management Oversight Consultant (PMOC). These will likely occur monthly and be day-long or multi-day meetings. (Up to 15 meetings.)
- Attend special meetings with Federal, City, County, FHWA, FTA, and other officials or consultants as directed by the STATE
- CONSULTANT will attend monthly deliverables/document control meeting
- Attend Risk Assessment Meetings administered by transit agency consultants and FTA's PMOC Consultant. (Assume two 3-day work sessions and follow-up activities to implement results.)

Task 7.1 Assumptions:

- Transit Task management responsibilities of the CONSULTANT may be adjusted as the result of on-going discussions between STATE and agency sponsors, resulting in changes to be noted in future revisions of this statement of work as may be agreed.
- CONSULTANT will attend monthly deliverables/document control meeting
- CONSULTANT will provide monthly progress reports (16)

Task 7.1 Deliverables:

The CONSULTANT will provide:

- New Starts Working Group meeting agendas, and decision notes (35) (AF7001)
- Quality Control Plan and updates (AF7002)
- Transit Design Coordination Group meeting minutes, agendas, and decision notes (35) (AF7003)
- Transit Technical Advisory Group meeting agendas and decision notes
- Develop and maintain Project Management Plan developed under work element 2.0 and use as a management tool.
- Develop and maintain QA/QC Plan developed under Task Order 2.0 for use as a management tool.
- PMOC meeting minutes (15); Provide written responses to questions and issues from FTA's PMOC. (AF7004)

7.2 Agency and Public Outreach Support

As part of a team lead by STATE and transit agencies, The CONSULTANT will support the sponsor agencies and public outreach efforts undertaken by the CRC project team throughout the duration of Task AF. Support efforts might include preparation of drawings, transit model output graphics, presentation slides, and public presentations of CRC information. Public outreach support will be included for advanced conceptual engineering and preliminary engineering as discussed in subtask 7.3 and subtask 7.6. Activities under this subtask include:

- Support for public meetings and/or events (18)
- Graphics and visualizations (up to 6 conceptual renderings)

Task 7.2 Assumptions:

- CONSULTANT will support the agency and public outreach effort on an as-needed basis, up to an assumed level of effort.
- A communications team member will assist the transit team in the development of transit capital facility planning activities through provision of input from community involvement activities.

Task 7.2 Deliverables:

The CONSULTANT will provide:

- Engineered drawings, transit model output graphics, presentation slides, and public presentations as requested (drawings provided will be based on drawings already created, and may require small modifications) (AF7005)

7.3 Advanced Conceptual Engineering

The purpose of this task is to further refine the transit LPA alternative and design options in order to support New Start Application process and discussions with public and agency stakeholders. The advanced conceptual engineering subtask will focus on the Light Rail Transit (LRT) as the HCT mode chosen in the LPA, and the LRT alignment option(s) remaining, and will consist of 1) producing information to support design option decision-making, 2) support for cost analysis for refinement of project capital and operating costs, and 3) addressing public, agency, and stakeholder comments and concerns regarding potential alignments and service. Factors such as operations, right-of-way impacts, cost, environmental resource impacts, constructability, traffic circulation and transit travel speeds will be analyzed. Currently known subject areas to be studied under this task include:

LRT Alignment Options

- Hayden Island alignment options (offset and adjacent)
- Vancouver CBD alignment options (two-way Washington and Broadway-Washington couplet)
- Clark College alignment options (McLoughlin and 16th Street)

LRT Interface Options

- Stacked transit/highway bridge (support to Task 8.4)
- Expo Center station interface
- Ruby Junction maintenance facility expansion requirements

Task 7.3 Assumptions:

- Design refinements will occur under the direction of the STATE and in coordination with transit sponsor agencies and other Project partner agencies.

Task 7.3 Deliverables:

The CONSULTANT will provide:

- Design documentation binder for design options considered (AF7005)
- Consolidated advanced conceptual engineering report documenting alignment and terminus location findings and recommendations (AF7006)
- Technical Memos for specific studies as necessary

- Capital cost analysis and estimate support for estimates developed in FTA standardized cost categories format (AF7007)

7.4 FTA New Starts Products and Coordination

The purpose of this task is to address the financial, organizational, environmental and administrative regulations which must be met prior to and during the PE/FEIS phase of the FTA project development process. Activities will include preparing informational or briefing materials that might be requested by the FTA as well as specific FTA deliverables required for the New Starts application process. It is noted that activities under this task overlap between Tasks AD and AF, such that some of the activities described may have been completed at the time Task AF is initiated. The CONSULTANT will support agency staff, as requested, in consultations with FTA to identify and address questions, issues or concerns prior to formal submission for project rating and for entry into preliminary engineering. Activities under this task include:

- Bi-weekly FTA/FHWA meeting support
- Support for TEAM coordination with FTA Regional and Headquarters staff regarding all aspects of the New Starts submittal including travel demand models, transit networks, SUMMIT results, network refinement, etc.
- Provision of support and technical data to the development of the LPA
- Support for FTA Risk Assessment activities
- Support for FTA New Starts application supporting documentation as required for FY2010 project rating by 8-14-08
- Preparation of updated FTA New Starts application for FY2011 project rating by 8-15-09
- Assistance to project sponsors in preparation of FTA application to enter preliminary engineering
- Finalize FTA Baseline Alternative Memorandum and estimates
- Finalize Operating and Capital cost methodologies
- Project Management Plan for the PE/FEIS phase.
- Update the Project Management Plan for the final design/implementation phase.
- Prepare Before & After Study documentation of methods and predicted results and identification of responsible contractors
- Monitor changes in FTA New Start and NEPA rules and procedures, assess impact on this project, and offer strategic advice to project TEAM
- Prepare written responses and technical data to support FTA's risk assessment of the project's scope, schedule, and budget at the conclusion of PE
- Monitor potential design options remaining to be addressed following the LPA decision that are being evaluated during the PE/FEIS process (including new costs associated

with mitigation decisions) and identify potential impact on project costs and benefits as they relate to the New Starts project rating

Task 7.4 Assumptions:

- CONSULTANT will prepare submittals for review and comment by the QA/QC team members, transit agencies, and by federal, STATE and local sponsor agencies
- Metro will be the signatory on travel forecasting for the New Starts application
- Project Management Plans and updates to require considerable involvement from STATE and sponsoring transit agencies.
- Fleet management plans to be done by TriMet and C-TRAN, with support from CONSULTANT

Task 7.4 Deliverables:

The CONSULTANT will provide:

- Alternatives Analysis Final Report (AF7008)
- Provide supporting technical data and document(s) for the development of the LPA memorandum
- Before & After Study Documentation of Methods and Predicted Results and Identification of Responsible Contractors Report
- FTA New Starts application for New Starts PE Approval (templates and maps) (AD7036)
- Update FTA New Starts application for FY 2011 on 8-15-09 (AF7009)
- FTA application to enter preliminary engineering (AD7036)
- Final FTA Baseline Alternative memorandum
- Capital cost estimate report
- Operating and maintenance cost estimate report
- Travel demand forecasting analysis and results technical memorandum
- Making the Case document for New Starts submittals (2008 and 2009)
- Lessons learned from travel demand forecasting analysis technical memorandum
- LPA and MOS operating plans and TNETS
- SUMMIT software reports and maps
- Written responses to questions/issues raised by FTA's Risk Assessment Consultant (AF7010)

7.5 Transit Service Planning and Analysis

The CONSULTANT, in collaboration with the CRC New Starts Working Group, will assist TriMet and C-Tran in developing the service plans and technical information to support the FEIS analysis and completion of FTA New Start applications and templates. Service plans will include routes, termini, and headway assumptions. The TEAM will support the travel demand forecasting process by preparing modeling packages and conducting a QA/QC check on transit patronage, station volumes, and SUMMIT results for each alternative. The TEAM will post-process the model results and support a round of alternative optimization model runs to fine tune the transit LPA alternative as well as two MOS alternatives. The CONSULTANT will support agency staff, as requested, in consultations with FTA to identify and address any questions, issues or concerns prior to formal submission for project rating and for entry into preliminary engineering. Activities conducted under this task include:

- Data collection
- Transit service planning and transit market analysis
- Prepare the transit sections of the modeling packages for the No-Build, FTA Baseline, and three Build Alternative packages (3 modeling packages each for the build alternatives and FTA Baseline for a total of 12)
- Model output QA/QC
- Analysis of SUMMIT output
- Review of transportation benefits report
- Model post-processing (up to 3 additional runs for analysis purposes)
- Evaluate minimum operable segment (MOS) and prepare implementation memo

Task 7.5 Assumptions:

- Contractor performance certification to be done by METRO
- All transit planning and modeling work, especially for New Starts, to be done for forecast year 2030.
- METRO to run regional model and prepare New Starts forecast(s) using the EMME/2 modeling platform
- CONSULTANT to prepare transit model output using SUMMIT
- Scope of work assumes up to 30 total model runs
- SUMMIT results to be done with latest version of SUMMIT as released and required for the New Starts process.
- Differences between METRO regional forecast model outputs, Incremental Logic Model outputs and ARRF model outputs will be analyzed by METRO

Task 7.5 Deliverables:

The CONSULTANT will provide:

- Modeling packages (up to 30). (AF7011)
- Transit performance and evaluation factors for incorporation into the transit technical report for the FEIS (AF7012)
- Revised criteria measures and results for the build alternatives (AF7013)
- SUMMIT and transportation benefits analysis technical report (AF7014)

7.6 Transit Preliminary Civil Engineering

The CONSULTANT will complete a design package to the preliminary engineering design level as defined by FTA during the timeframe of Task Order AF, and prepare a design package containing plans and profiles and details. The design and details will be prepared to such detail that quantities can be taken off the plans, right-of-way impacts can be assessed, and capital costs can be estimated with a high degree of confidence and meet FTA requirements for the FEIS and for application to enter Final Design. Track alignment drawings are to be completed at 1"=40' [should be 1"=20'] scale on 11" x 17" plan sheets using the CRC format.

7.6.1 Surveying and Mapping for Transit

The CONSULTANT, in collaboration with the Transit Working Group, will provide surveying and mapping services to meet transit preliminary engineering design needs. For transit design on this project, surveying and mapping are differentiated by the lack of current detailed aerial mapping, precise survey control needed to meet transit construction specifications, many obstructions to GPS satellites, and dense urban development.

7.6.1.1 Survey Control

The CONSULTANT will provide stable survey control with precise coordinates and elevations to meet transit design and construction requirements for the LPA. For the primary control system, the CONSULTANT will typically set a small brass cap control monument in the sidewalk at each street intersection along the urban portion of the route. Where no suitable existing concrete exists, stable monuments (two-inch aluminum caps on 5/8" iron rods set in at least one cubic foot of new concrete) will be used. Caps pre-stamped "CRC CONTROL" are available for this purpose. The point number will be added. Suitable found monuments may be incorporated into the control network. Monuments shall be inter-visible.

Control point coordinates and elevations will be established in a least squares network adjustment. Measurements incorporated into the network will include elevation differences measured between control points and to existing bench marks with a digital electronic level and precise bar-code rod. Also included will be Global Positioning (GPS) static survey measurements and conventional traverse measurements made with a precise calibrated electronic theodolite.

7.6.1.2 Base Mapping

The CONSULTANT will provide base map data suitable for transit design. Field survey data will be collected to map and model the project corridor. In downtown Vancouver, the initial

mapping limits are expected to include the entire right-of-way between building faces. Intersecting streets will typically be surveyed at least 100 feet further.

The field data will be gathered for the alignment that is proposed in the New Starts application to the FTA. The initial limits for this survey include areas where transit is proposed where existing base map aerial data is not available or sufficient.

Items to be surveyed include: Utility structures and tone marks, invert elevations of storm and sanitary sewer, existing rail and station limits, driveways and building entries, building faces and back of sidewalks, tops of curb, flow lines, curb returns and ramps, roadway centerlines, gutters, existing utility poles and facilities, found monuments, existing intersection signal facilities, signs and existing planters and trees.

The CONSULTANT will ensure that traffic control plans are developed and approved by both Oregon and Washington State Department's of Transportation before survey work begins.

The CONSULTANT will request that utilities mark their underground facilities. Utility structures and marks will be surveyed. Invert elevations of storm and sanitary sewer pipes will be surveyed. Many utility record maps have been gathered for this project. The utility lines will be mapped using field data and utility records. Follow-up contacts will be made to the utilities if marks are not placed or if additional maps are needed. The CONSULTANT will share the utility information that is gathered with other disciplines on the project, including the highway engineering group.

The information will be added to the project base map and digital terrain model (DTM). Geotechnical and pavement design sampling locations will be surveyed and shown on the project base map.

7.6.1.3 Design Details

The CONSULTANT will provide detailed survey and mapping information needed to complete the transit design package. These details may include pavement type limits, overhead clearances, under-sidewalk vaults, utility vaults, building entries, new (or proposed) improvements, exposed (potholed) utilities, ties to structures, grade crossings, etc. The information will typically be provided by augmenting the project base map.

Assumption:

- In areas where transit does not follow state highways, no ODOT roll map or WSDOT right-of-way plans are required.
- Right-of Way Resolution provided in Task 8

7.6.2 Track Alignment and Details

The CONSULTANT will optimize and freeze the LRT track alignment and profile for the alignment to be used for preliminary engineering purposes. The tasks to complete this are listed below.

- Develop track plan and profile sheets

- Develop typical track sections
- Develop computerized cross sections throughout project at 50 foot stations
- Develop track sections and details for all major section variations and track types.
- Develop horizontal alignment data charts for both tracks
- Coordinate typical track drainage approach and details with Task 8.0 Civil and Bridge Task Leads

7.6.3 Civil Engineering Plans

Task 7.6.3 Assumptions:

- At the time of approval of Task AF Budget no decision had been made whether the CONSULTANT or Agency would be responsible for System Buildings. This work will be considered extra services if it is to be done by the CONSULTANT.

The CONSULTANT will provide assistance to the transit agencies to identify locations for LRT related buildings and Park and Ride facilities. The CONSULTANT will also determine the building types and size. Preliminary engineering site plans and floor layouts will be prepared for the buildings. Preliminary engineering plans for the Park and Rides will be prepared depicting the parking lot configuration and features. The tasks to complete this level of detail are listed below.

- Operator/Security Building
 - Determine the building type, size, location and other site requirements Operator building (1 Site)
 - Prepare site and floor plan at 1"=40' scale on 11" x 17" plan sheets
- System Buildings
 - Determine the building type, size, location and other site requirements for signal and communication buildings (3 sites)
 - Determine the building type, size, location and other site requirements for Substation buildings (3 sites)
 - Prepare site plan for each systems building at 1"=40' scale on 11" x 17" plan sheets
 - Develop base program requirements for site development requirements and services for each building.
- Park and Ride site plans
 - Determine the building type, size, location and other site requirements for up to 3 structured park and rides (SR14, Mill Plain, Clark)
 - Determine size and location for up to 3 surface park and rides (Lincoln, Kiggins, Clark)
 - Prepare a site plan for each park and ride at 1"=40' scale on 11" x 17" plan sheets
 - Prepare typical floor circulation plans for each structured park and ride.

7.6.4 Roadway Civil

The CONSULTANT will develop the civil roadway plans and details along the transit alignment identifying the limits of construction. The tasks to complete this level of detail are listed below. Coordinate as necessary with overall highway engineering effort as listed in AF Task 8.3. Coordinate with streetscape and urban design efforts as listed in AF Task 7.7.

- Determine limits of demolition and reconstruction.
- Determine all street section types and construction limits for the anticipated modifications required by the project.
- Determine preliminary roadway drainage changes.
- Develop roadway plans at 1"=40' scale on 11" x 17" plan sheets

7.6.5 Civil/Systems Coordination

Task 7.6.5 Assumptions:

- At the time of approval of Task AF Budget no decision had been made whether the CONSULTANT or Agency would be responsible for Civil/System coordination. This work will be considered extra services if it is to be done by the CONSULTANT.
- Develop and maintain Civil/Systems interface issues list
- Lead up to 3 sessions focusing on integration of the LRT systems elements with other design efforts, including structures, utilities, traffic signals, grounding and site development.
- Develop base program requirements for Civil/systems Coordination

7.6.6 Traffic Engineering and Intersection Design at LRT Crossings

The CONSULTANT will identify locations for new traffic signals and signal revisions. Conceptual level striping plans will be prepared showing the type and location of the project striping. The tasks to complete are listed below. Coordinate as necessary with Transit agency sponsors and overall highway engineering effort as listed in AF Task 8.3.5 and Task 5.4

- Coordinate pedestrian and bicycle facility base program requirements with Task 4.2.2
- Develop train and traffic signal interconnect program requirements based on traffic study and analysis within AF Task 5.X
- Develop train/ traffic signal pre-emption base program requirements.
- Determine train signal elements to be included on traffic signal mast arms
- Prepare conceptual level intersection layout plans for up to 25 intersections at 1"=40' scale on 11" x 17" plan sheets if needed
- Coordinate with signage and striping design for roadway under Task 8.3.6
- Traffic staging and management plans will be developed by others in Task 8.3.5

Task 7.6 Assumptions:

- The level of design outlined above will only be provided for the preferred alternative.
- All products will be to a preliminary engineering level unless specifically noted.
- The alignment subject to preliminary engineering will be the one submitted for the FTA New Starts PE Approval
- TriMet 2005 Design Criteria will be used as the basis for the PE design effort
- TriMet Design vehicle (Low Floor cars) will be the basis of design.
- LRV will be single and two car lengths only.
- Traffic Signals will have pre-emption and will be interconnected and interface with LRT train signals.
- Micro Station will be the CAD platform for design and drafting of plans.
- The 11"X17" WSDOT Title Block will be used for all sheets developed.

Task 7.6 Deliverables:

The CONSULTANT will provide a Preliminary Engineering design package (AF7015), containing a title sheet, index, key maps and the following drawings, details and reports:

- Track plan and profile sheets for PE alignment.
- Typical Track Sections
- Roadway plan sheets for PE alignment.
- Roadway cross section detail sheets as necessary
- Intersection layout plans
- Building site plans
- Park and Ride site plans and typical details
- Summary of quantities
- Summary of base program requirements identified for elements in this task.
- Civil Description Report at conclusion of Task AF

The CONSULTANT will provide:

- Survey control monuments and references set in place.
- A least-squares network adjustment report, including the measurements taken, adjustments, and final coordinates and elevations.
- Current Project Base Map with DTM to project standards.

7.7 Transit Station and Urban Design/Architecture

The CONSULTANT will prepare preliminary design plans, elevations and typical sections and elevations for up to 6 stations: Expo, Hayden Island, 7th Street, 11th Street, Mill District, and Clark. Site plans will be at 1"=40' scale on 11" x 17" plan sheets

Prior to preliminary design, the TEAM will perform station area analysis for each station to identify opportunities and constraints for each station and potential minor modifications to station location through an urban design analysis. The TEAM will assist the City of Vancouver, C-TRAN, TriMet and City of Portland with development of project urban design guidelines and overall themes and goals for each station. The TEAM will work with stakeholders to develop and coordinate Station Area Design, Urban Design, and Streetscape Plans.

7.7.1 Station and Alignment Planning Analysis

The TEAM will perform station area and alignment planning analysis to support preliminary design to develop plans and concepts that optimize benefits of the project to adjacent stakeholders and users. Tasks include:

- Review relevant public documents, plans, regulations and public works that affect each station area
- Inventory adjacent uses to ascertain development potential
- Assess land use and transportation access to each proposed station area
- Prepare Station Area Transit Oriented Development (TOD) capacity and opportunity study
- Prepare a comparative analysis of station area development potential in matrix form, based on access; regulatory constraints; site availability and plans.
- Prepare a conceptual analysis of alignment development potential block face by block face along the CBD alignment.
- Utilize Public and Stakeholder input in development of design goals and objectives for station area and development adjacent to the alignment.
- Identify bicycle and pedestrian access routes for each station
- Perform initial assessment of platform and station location based on proximity to developable parcels, quality of pedestrian connections, existing and planned urban character.
- Confirm Hayden Island TOD analysis based on work already completed
- Lead Community and Stakeholder Station Area/Alignment Analysis and Design Meetings (6)
- Prepare summary of community interests
- Create Station Area Theme(s)
- Prepare Station Area Development Recommendations

- Assist project sponsors staff in discussion with current landowners regarding opportunities for development or redevelopment and integration with the project

7.7.2 LRT Station Design

Perform preliminary design of LRT stations to include the following activities:

- Prepare site plan for each station
- Prepare demolition and retrofit plan for Expo
- Prepare typical platform plan and elevation with station furnishings
- Prepare typical sections for station types
- Develop elevator siting requirements for elevated station
- Develop platform amenities matrix of station furnishings
- Develop base program requirements
- Coordinate with agencies and stakeholder groups regarding station area planning

7.7.3 High Capacity Bus Stop/Transfer areas

Perform preliminary design of High Capacity Bus Stop locations to include the following:

- Prepare site plan for each HC bus transfer areas (12)
- Prepare typical sections for HC bus transfer areas
- Develop HC Amenities Matrix of HC stop furnishings
- Develop base program requirements

7.7.4 Operator Relief/ Security Building

Perform preliminary design of Operator building:

- Prepare exterior elevations and floor plans in concert with Task 7.6.2
- Develop base program requirements

7.7.5 CTRAN Bus Maintenance Facility and Yard

Perform preliminary design support for C-Tran bus maintenance facility improvements if determined to be required for the project to include:

- Develop program scope
- Develop conceptual level facility layout
- Develop conceptual level bus yard layout
- Develop base program requirements

7.7.6 Urban Design Guidelines

Through an interactive process with adjacent community and agency stakeholders, and in coordination with station/alignment planning analysis task, develop concept plan for block by block interface with adjacent development and guidelines for streetscape plans. This activity is to be conducted in coordination with the Urban Design Advisory Group (UDAG).

- Develop Urban Design program scope
- Lead Urban Design sessions
- Track issues and options
- Develop base program requirements
- Incorporate recommendations as applicable
- Perform Station Area Transit Oriented Development opportunity studies
- Coordinate with community outreach effort for specific issues

7.7.7 Streetscape Plans

On basis of urban design guidelines, develop streetscape preliminary design:

- Develop Streetscape limits and scope
- Develop base program requirements
- Incorporate recommendations as applicable
- Prepare typical streetscape sections

7.7.8 Landscape and Irrigation

- Develop conceptual level Landscape and irrigation plans for; the LRT Alignment, Stations and Station Areas, Park and Rides, and buildings, and water quality areas required by the LRT. Develop base program requirements

7.7.9 Lighting

Assumptions:

- At the time of approval of Task AF Budget no decision had been made whether the CONSULTANT or Agency would be responsible for lighting. This work will be considered extra services if it is to be done by the CONSULTANT.

Develop preliminary design for project lighting requirements for all transit components including stations, park and rides, miscellaneous buildings, alignments and adjacent roadways affected by the project.

- Develop lighting limits and scope
- Develop conceptual lighting plans
- Confirm design criteria for light levels and type for various public areas

- Develop base program requirements

7.7.10 Public Art Program

Under direction of project sponsors and in coordination with UDAG, develop guidelines and implementation plans for public art program.

- Develop Art program scope
- Lead Art program sessions with Art Advisory Committee (up to 3 sessions)
- Identify opportunities for Art projects
- Identify integrated art element opportunities
- Develop base program requirements

Task 7.7 Assumptions:

- The level of design outlined above will only be provided for the preferred alternative.
- Hayden Island Station Area work will incorporate previous studies.
- All sub-elements of this task will be coordinated with overall themes for Station Areas.
- Public Outreach for Planning and Design will be closely coordinated.
- All products will be to a preliminary engineering level unless specifically noted.
- TriMet 2005 Design Criteria will be used as the basis for the PE design effort except where specifically noted.
- CTRAN Bus Design Criteria will be used as the basis for the PE HC stop and maintenance facility design efforts.

Task 7.7 Deliverables:

The CONSULTANT will provide a Preliminary Engineering design package (AF7016), containing a title sheet, index, key maps and the following drawings, details and reports:

- Meetings and coordination with city groups, transit agencies, and stakeholders on station area planning
- Station Area Plans and TOD Recommendations
- Block face development opportunity recommendations for Vancouver CBD
- Summary of Community/Stakeholder design goals and objectives
- Station Amenities and Deficiencies Matrix based
- Station Area Recommendations
- Station Site plans
- Typical platform Plans and Elevations
- Station Amenities Matrix

- HC Bus Stop Site plans
- HC Amenities Matrix
- Streetscape Plans and Sections
- Roadway cross section detail sheets as necessary
- Transit Urban Design Guidelines
- Transit related lighting style and foot-candle requirements
- Conceptual Level Landscape Plans
- Art Program Framework
- Summary of quantities
- Summary of base program requirements identified for elements in this task.

7.8 Transit Systems Engineering

The Consultant will prepare a preliminary engineering design package of transit systems elements as outlined below. The preliminary engineering design package drawings will be completed on 11" x 17" plan sheets using the CRC format.

Task 7.8 Assumptions:

- At the time of approval of Task AF Budget no decision had been made whether the CONSULTANT or Agency would be responsible for transit systems engineering. This work will be considered extra services if it is to be done by the CONSULTANT.

7.8.1 Transit systems studies

Perform the following studies/analyses and coordination activities to support transit preliminary design:

- Perform a Stray Current Corridor Study
- Perform a system load flow analysis
- Perform a system runtime analysis
- Perform Substation location analysis
- Identification and analysis of other systems requirements on TriMet's existing LRT System if needs are created by addition of service.
- Coordinate with state and local electrical oversight groups relative to inspection and code requirements
- Coordinate with state and local oversight groups relative to at grade crossings.
- Develop Expo Station tie-in systems modification requirements
- Develop base program requirements for system testing and simulation
- Monthly design review with TriMet systems engineers

7.8.2 Traction electrification system

Perform preliminary design of traction electrification system sufficient for development of program requirements and project cost estimates.

- Develop conceptual level OCS layout
- Develop list of main system hardware elements (e.g. pole type, wire size)
- Coordinate with power supply companies to develop preliminary main feeder requirements and routes
- Determine system voltage and tie-in requirements to existing system
- Coordinate with other public utilities regarding existing facility issues
- Develop interior substation layout and equipment list
- Develop base program requirements
- Monthly design review with TriMet systems engineers

7.8.3 Signal System Design

Perform preliminary design of LRT signals system sufficient for development of program requirements and project cost estimates.

- Develop conceptual level signal system layout
- Develop conceptual level duct bank system layout
- Develop conceptual level signal system interconnect layout at expo
- Develop list of main signal system hardware elements
- Coordinate with the City traffic signal designers and operations group
- Determine signal interconnect requirements to existing traffic systems
- Determine signal equipment housing requirements
- Determine signal cabling base line and interface with existing components
- Develop base program requirements
- Monthly design review with TriMet systems engineers

7.8.4 Communication System Design

Perform preliminary design of LRT communications system sufficient for development of program requirements and project cost estimates.

- Develop conceptual level communication system layout
- Develop list of communication system hardware elements
- Coordinate with the agencies regarding fiber share and new routes
- Determine communication equipment housing requirements

- Determine communication fiber base line and interface with existing components
- Develop base program requirements
- Monthly design review with TriMet systems engineers

7.8.5 CCTV System Design

Perform preliminary design of LRT Closed Circuit Television (CCTV) system sufficient for development of program requirements and project cost estimates.

- Develop CCTV program scope
- Develop conceptual level CCTV system layout
- Coordinate with the agencies regarding CCTV coordination
- Develop base program requirements

7.8.6 Fare Collection and Transit Tracker

Perform preliminary design of LRT fare collection and transit tracker systems sufficient for development of program requirements and project cost estimates.

- Coordinate with agencies regarding fare collection
- Develop base program requirements for equipment
- Develop conceptual level technology migration and upgrades

7.8.7 Existing TriMet Maintenance Facility and Rail Yard Expansion

Perform preliminary design of LRT maintenance facility requirements sufficient for development of program requirements and project cost estimates.

- Coordinate with TriMet on facilities and expansion
- Develop expansion program scope
- Develop conceptual level facility expansion layout
- Develop conceptual level yard expansion layout
- Develop base program requirements

7.8.8 Central Control Interface with CTRAN and TriMet Facilities

Perform preliminary design of central control systems in coordination with communications tasks, sufficient for development of program requirements and project cost estimates.

- Develop Central Control program scope
- Develop conceptual level facility expansion layout
- Develop conceptual level technology migration and upgrades
- Develop base program requirements

7.8.9 Vehicle Design

Perform preliminary design/analysis activities related to transit and support vehicles sufficient for development of program requirements and project cost estimates.

- Coordinate with TriMet regarding vehicle design
- Develop Vehicle program scope
- Develop base program requirements

Task 7.8 Assumptions:

- The level of design outlined above will only be provided for the preferred alternative.
- All products will be to a preliminary engineering level unless specifically noted.
- TriMet Design Criteria will be used as the basis for the PE design effort.
- Low Floor cars will be the basis of design.
- Compatibility with existing LRT system components will guide the design.

Task 7.8 Deliverables:

The CONSULTANT will provide a Preliminary Systems Engineering design package (AF7017), containing a title sheet, index, key maps and the following drawings, details and reports:

- System wide Electrical Duct bank plans
- System wide Electrical Service Schematics
- Signals Single Line Diagrams
- Signals Control Line Diagrams
- Grade Crossing Layouts
- Typical Station Grounding Plan
- CTS Back Bone single line diagram
- Optical fiber cable plans
- Communication Subsystem Tabulation
- Scada Network Single Line diagrams
- Maintenance /Admin Network single line diagram
- TES DATA network single line diagram
- TVM network single line diagrams
- CCTV transmission single line diagram
- Typical CCTV Station Network single line diagram
- Proposed Sectionalizing Schematics
- Master Overlap charts

- OCS wiring layout plan
- Systems Description Report
- Stray Current Study
- Load Flow Analysis
- System Runtime analysis
- Summary of quantities
- Summary of base program requirements identified for elements in this task.

7.9 Transit Structural Design

The CONSULTANT will complete preliminary engineering of transit structural components as described herein. The design and details will be completed to such detail that quantities can be taken off the plans, right-of-way impacts can be assessed and cost estimates can be performed at a sufficient level of detail for preliminary engineering. Geotechnical information will be provided to the Transit TEAM from the effort listed in AF Task 8.4.5. Drawings are to be completed on 11" x 17" plan sheets using the CRC format.

7.9.1 Transit Related Structures

The design effort for all major structures will be as detailed in Task 8.4. The structural effort to complete the tasks not included in Task 8.4 are listed below.

- Develop typical sections and profiles for small walls, platform slabs, station amenities foundations related to LRT elements
- Develop structural plans and details for the parking structures.
- Develop standard OCS pole foundations

Task 7.9 Assumptions:

- The level of design outlined above will only be provided for the preferred alternative.
- All products will be to a preliminary engineering level unless specifically noted.
- TriMet Design Criteria will be used as the basis for the PE design effort.
- No small building structural design will be performed in subtask 7.9 of Task AF
- No sound wall design will be performed in subtask 7.9 of Task AF
- Elevated structure requirements at the Hayden Island Station are not included in this task, but are included in Task 8.

Task 7.9 Deliverables:

The team will provide plan drawings for the following: (AF7018)

- Parking Structure building and foundation details
- Summary of quantities

- Summary of base program requirements identified for elements in this task.

7.10 Preliminary Engineering Special Studies/Reviews

The TEAM will conduct the following studies to facilitate the preparation of preliminary engineering work. Each of the studies will focus on specific elements of design and will be focused on obtaining approvals where appropriate.

7.10.1 CPTED (crime prevention through environmental design) review

- Develop CPTED program scope and standing members
- Lead in CPTED sessions and track issues and options (6 Meetings)
- Develop base program requirements
- Incorporate recommendations as applicable
- Coordinate with appropriate community outreach effort for specific issues

7.10.2 Safety and Security (FLS) review of all LRT elements

- Develop FLS program scope
- Develop list of agencies and first responders and representatives from each.
- Lead FLS sessions and track issues and options(6 Meetings)
- Develop base program requirements
- Incorporate recommendations as applicable

7.10.3 Design Criteria Summary Report

- Collect and document Design Criteria used to develop preliminary engineering documents.
- TriMet has standard design criteria developed
- Prepare Design Criteria Document for final design
- Submit to WSDOT, ODOT, CTRAN, TriMet, COV, PDOT for approval

Task 7.10 Assumptions:

- The studies outlined above will only be provided for the preferred alternative.
- All products will be to a preliminary engineering level unless specifically noted.
- TriMet Design Criteria will be used as the basis for the Design Criteria Document.
- CPTED program will be limited to transit station areas and park and rides
- FLS program will be limited to LRT corridor
- The STATES and other agencies make the final decision as to which design criteria are included

Task 7.10 Deliverables:

- CPTED program summary of PE findings and recommendations (AF7019)
- FLS program summary of PE findings and recommendations (AF7020)
- Project Design Criteria Document (AF7021)

7.11 Transit Preliminary Engineering Coordination

The TEAM will coordinate with other CRC activities during the timeframe of Task Order AF, and respond to requests for information and incorporate information as necessary to complete the Transit design package. The following are anticipated efforts that will require Transit TEAM involvement.

7.11.1 Project Construction Packaging and Sequencing

Assumptions:

- At the time of approval of Task AF Budget no decision had been made whether the CONSULTANT or Agency would be responsible for project construction packaging and sequencing. This work will be considered extra services if it is to be done by the CONSULTANT.
- Identify LRT Segmenting in association with other project participants.
- Develop Contract Packaging assumptions in association with other project participants.
- Develop Conceptual construction schedule and sequencing
- Develop Preliminary Transit Program Permits Matrix
- Establish Draft Table of Contents for technical specifications applicable to major LRT elements within the PE document (WSDOT, ODOT, CTRAN, TriMet, COV, PDOT)

7.11.2 Public and Private Utility Coordination Protection and Relocation

Coordinate with overall Utility Coordination effort as listed in AF Task 8.3.3

- Identify preliminary power feed locations and service level requirements for the major LRT elements.
- Identify preliminary water service locations and service levels for the major LRT elements.
- Coordination with utility owners (public and private) and local transit agencies to achieve agreement on disposition of affected utilities performed by others in AF Task 8.3.3.

7.11.3 Sustainability Reviews

Assumptions:

- At the time of approval of Task AF Budget no decision had been made whether the CONSULTANT or Agency would be responsible for sustainability reviews and

sequencing. This work will be considered extra services if it is to be done by the CONSULTANT.

- Develop Transit Sustainability program scope
- Lead Transit Sustainability sessions (2)
- Identify opportunities for Transit Sustainability (e.g. LEEDS)
- Develop base program requirements for sustainability related to LRT
- Coordinate with and incorporate project wide recommendations developed under Task 6.13.3 as applicable

7.11.4 Drainage and Storm Water Management plan

- Provide transit specific information to Highway TEAM and coordinate with overall drainage storm water management effort as listed in AF Task 8.3.2

7.11.5 Noise and Vibration Mitigation

Assumptions:

- At the time of approval of Task AF Budget no decision had been made whether the CONSULTANT or Agency would be responsible for noise and vibration mitigation. This work will be considered extra services if it is to be done by the CONSULTANT.
- Review Project data and confirm potential noise and vibration impact areas relative to LRT alignment
- Coordinate with TEAM developing mitigation treatments as listed in AF Tasks 6.7.4 and 6.12, specific to LRT elements.
- Perform video documentation of key buildings for Preconstruction Video Log along transit corridor.

7.11.6 Cost Estimating

- Support cost estimating processes undertaken in AF Tasks 8.5.

Task 7.11 Assumptions:

- All products will be to a preliminary engineering level unless specifically noted.
- TriMet Design Criteria will be used as the basis for the PE design effort.
- Micro station will be the CAD platform for design and drafting of plans.
- The 11”X17” WSDOT Title Block will be used for all sheets developed.

Task 7.11 Deliverables:

The CONSULTANT will provide:

- Summary of Contract Packaging assumptions (AF7022)
- Conceptual construction schedule and sequencing (AF7023)

- Preliminary Permits Matrix (AF7024)
- Summary of base program requirements identified for elements in this task. (AF7025)
- Table of contents for technical specifications (AF7026)
- Video documentation log and CD's (AF7027)

7.12 Support FEIS Preparation

The CONSULTANT shall support the preparation of the FEIS, including an evaluation of the PE alignment and additional modeling packages as necessary. The CONSULTANT shall prepare a report summarizing the alternatives evaluation and the methodology used for incorporation into the administrative draft FEIS documents for review. Activities to be done in this subtask include:

- Support FEIS preparation
- Revised draft of the Transit Methods and Data Report (MDR) if required
 - Supplemental Technical Analysis Report #1
 - Supplemental Technical Analysis Report #2
- Transit technical report following MDR procedure
- Prepare transit information for the FEIS

Task 7.12 Assumptions:

- CRC transit team to support preparation of the FEIS in coordination with the environmental task
- FEIS comments are received in a database or other administrative tracking format

Task 7.12 Deliverables:

The CONSULTANT will provide:

- Revised Transit Methods and Data Report (if needed) (AF7028)
- Revised Transit technical report (if needed) (AF7029)
- Transit information for FEIS (5 drafts) (AF7030)
- FEIS mitigation strategy memorandum (AF7031)

7.13 Support for Other CRC Disciplines

The CONSULTANT shall support other CRC disciplines with technical data and documents; on an as-needed basis throughout the duration of the task order, including:

- Environmental team
- Engineering team
- Communications team

- Project management support
- Project controls
- Transportation planning
- Financial and Institutional Structures (transit operating and capital cost models, and FTA financial documentation including Finance Plan)
- Information and support documentation as requested

7.14 Coordination for Planning, Permitting, and Zoning Constraints

The TEAM shall work with the appropriate Agencies to coordinate on planning, zoning, and permitting issues for design of the following transit elements – station site plans, park and ride facilities, maintenance facilities, HCT track alignment, street redesign, utility coordination, traffic signals, and lighting.

Task 7.14 Assumptions

- The CONSULTANT level of effort will be limited by agreed Task AF budget constraints in coordination with the STATES and Agencies.

Task 7.14 Deliverables:

- Coordination and discussion with appropriate Agencies.
- Research of codes and policies.
- Presentations to design commissions or other related bodies

7.15 Coordination with Cities, Property-Owners, and Stakeholders to Implement Station Area Recommendations

Under direction of project sponsors, conduct conversations with individual landowners and business operators to identify, enable, and provide support for implementing development, redevelopment, or building enhancement that integrates or takes advantage of improvements that are part of the transit project. The TEAM shall identify opportunities to work with property owners, neighborhood associations, cities, and other stakeholders to implement Station Area Recommendations from Task 7.7.1. This should be in coordination with activities and recommendations from Task 7.7.1 and help implement selected approaches to increase economic activity and quality of the built environment along the alignment. This shall involve outreach to outreach to property-owners, neighborhood associations, and other stakeholders to provide strategies for implementing recommendations.

Task 7.15 Assumptions:

- The CONSULTANT work will be limited by Task AF budget agreement as covered under Work Element 4.0. The STATES will have a separate agreement with the Agencies to lead in this task.

Task 7.15 Deliverables:

- Develop Implementation Scope for Station Area Recommendations (AF7032)
- Outreach to property-owners, neighborhood associations, and other stakeholders to provide strategies for implementing recommendations. (AF7033)
- List of potential resources available for stakeholders wishing to implement recommendations (e.g. grants available for storefront improvements). (AF7034)

8.0 HIGHWAY PLANNING AND ENGINEERING

The purpose of this work element is to complete the highway engineering tasks necessary to advance the project to a Record of Decision (ROD). The work also includes providing appropriate responses to comments received from the published DEIS and addressing any mitigation measures proposed for the final EIS. Responses to agency resolutions on the LPA and necessary design refinements will be accomplished as well as providing assistance in obtaining a ROD.

Specific tasks for completion of the highway engineering are detailed below:

8.1 Design Team Project Management and Quality Control

8.1.1 Team Management

The CONSULTANT will coordinate and monitor the daily activities of the Highway Engineering team and provide oversight of all activities related to Work Element 8.0. This will include all coordination with the other Task Managers and other working groups. Project activity assignments, budgetary reporting and staff scheduling will be a part of this subtask.

8.1.2 Scheduling

Provide and maintain updates to project schedules to Project Controls as described in Work Element 2.3.

8.1.3 Internal Coordination Meetings

The CONSULTANT will:

- Attend bi-weekly Highway-Bridge Design Team Coordination meetings (estimated at 35) for approximately one hour each. Meetings will be held in the CRC project office and will include up to six team members.
- Attend bi-weekly Highway-Transit-Traffic Team meetings (estimated at 35) for approximately one hour each. Meetings will be held in the CRC project office and will include up to two Highway team members. The intent of this meeting is to provide task manager coordination for the efforts of the three teams.

- Attend bi-weekly task manager meetings (estimated at 35) for approximately two hours each. The meetings will be held in the CRC offices and will include up to three team members. A total of one hour for preparation and documentation will be required for each meeting.
- Attend weekly internal Engineering Update meetings (estimated at 70) for approximately one hour each. The meetings will be held in the CRC office and will include up to three team members.

8.1.4 External Coordination Meetings

The CONSULTANT will:

- Attend monthly deliverables/document control meeting.
- Attend up to 30 Working Group meetings with the STATE and other partner agencies as requested for approximately two hours each. Meetings will be held in the CRC project office and will include up to three team members. A total of two hours for preparation and documentation will be required for each meeting.
- Attend up to 30 meetings with third parties as requested for approximately two hours each. 25 of the meetings will be held in the CRC project office, five meetings will be held in the Portland area. Up to four team members will attend. A total of two hours for preparation and documentation will be required for each meeting.

8.1.5 Quality Control

The CONSULTANT will provide coordination, and oversight of quality control in accordance with the CRC Quality Control Procedures. Comments and responses will be logged into document control as per CRC requirements. A summary of QC activities will be provided on a quarterly basis.

Assumptions:

- Duration September 1, 2008 through December 31, 2009.
- 16 monthly progress reports and schedule updates to be provided to the STATES.
- 135 sets of minutes for all design related meetings.

Deliverables:

- 4 quarterly QC summary reports (AF8001)

8.2 Supplemental Surveying and Right-of-Way Services

Services performed under this Work Element are intended to support highways exclusively unless otherwise noted in the following sub-elements.

8.2.1 Topographic Surveying and Mapping

The CONSULTANT will utilize the existing Digital Terrain Model (DTM) and base mapping that was developed in Task AD. Additional coverage or added detail will be incorporated into that developed in Task AD.

The CONSULTANT will collect all terrestrial survey data in a format compatible with CRC'S software versions. An Inroads DTM associated with a Bentley MicroStation detail (base) map will be created.

The data collected by the CONSULTANT will be limited to items missed or obscured in the original data, or to up date or supplement the current data. This may include existing surface features such as building faces, fences, utilities, curbs, sidewalks, driveways, trees, signs and other significant items. Selected underground facilities will also be collected including type, size, location and invert elevations.

Locations of proposed geotechnical borings will be staked as required. Coordinate data will be provided by the Highways Team.

The CONSULTANT will collect all terrestrial survey data in a format compatible with CRC'S software versions. An Inroads DTM associated with a Bentley MicroStation detail (base) map will be created.

8.2.2 Supplemental Rights-of-way Survey

The CONSULTANT will provide surveys as necessary to identify and describe parcels of property needed for rights-of-way acquisition, permanent easements, and temporary construction easements. Proposed encroachment limits will be provided under Work Element 8.3.

8.2.2.1 Utility Survey

The CONSULTANT will request selected underground utilities be marked in the field (known as "field locates") within, and 200 feet beyond the expected improvement limits. The statewide "one-call" utility notification system will be used.

The CONSULTANT will gather the field data to show selected utility locations in the base mapping for the roadway and transit design.

8.2.3 Potholing

It is assumed that there will be potholing required to locate selected underground utilities. Potholing needs will be identified under Work Element 8.3.3.

Assumptions:

- STATE will provide for right-of-entry to the properties to be surveyed, identified by tax ID numbers and locations, with two months advance notice.
- STATE will provide traffic control equipment (such as crash trucks) and personnel if needed for survey on state highways.

- CONSULTANT survey crews will consist of one to three persons per crew plus one hour of data reduction, etc. per crew hour.
- Draft ROW plans and updates will be provided under Work Element 8.3.
- Establishment of right-of-way lines and calculation of property acquisitions will be provided under Work Element 8.3
- Aerial mapping and DTM provide by STATE meets specifications.
- Parcel ownership search acquired under Tasks AC and AD will be checked and updated.
- Estimated costs of right-of-way appraisals, acquisitions, and relocations will be provided by the STATES.
- Franchise and utility agreements will be made available to the CONSULTANT by the agencies.
- Electronic files of DTM features in InRoads and MicroStation CADD files will be maintained in the Project electronic file library.

Deliverables:

The CONSULTANT will provide:

- Survey field notes (AF8002)
- Updated base map and DTMs (AF8003)
- Parcel descriptions and draft exhibits (AF8004)
- Updated right of way and parcel maps (AF8005)

8.3 Civil Design

The purpose of this phase of work is to provide highway design for the preferred alternative as defined by the CRC and necessary to support advancement of the Project to the issuing of a Record of Decision (ROD). Support for the Transit Work Elements, if required, will be provided as specified in each of the following sub-elements.

8.3.1 Highways

The CONSULTANT will complete design for use in the acquisition of the ROD. These items will be developed so as to become part of a highway concept plan package for the preferred alternative. The package will be developed to such a detail that quantities can be taken off the plans and right-of-way impacts can be assessed. Design drawings are to be completed at 1":100' scale on 11" x 17" plan sheets using the CRC format. The tasks to complete this level of detail are listed below.

- Develop typical roadway sections for mainline, ramps, and cross streets
- Develop mainline alignments and profile
- Develop ramp alignments and profiles

- Develop cross street alignments and profiles
- Develop templates for mainline, ramps, and cross streets
- Model alignments and develop cross-sections
- Prepare draft ROW plans and updates
- Prepare quantities for those items developed for acquiring the ROD and those necessary to support a CEVP
- Prepare draft design packages, containing those items developed in acquiring the ROD. These packages will follow the formats of a Design Acceptance Package for ODOT facilities and a Design Documentation Report for WSDOT facilities. Additional items developed during the task such as design exceptions and deviations, Interchange Plans for Approval, etc will also be included in the packages.

8.3.2 Drainage and Stormwater

The CONSULTANT will prepare layouts and sizes of water quality/flow control facilities that are compatible with the highway design provided under Work Item 8.3.1 and the structural design provided under Work Item 8.4.1 and 8.4.2. Typical sections of the facilities and ditches or other conveyances associated with the facilities will be included. ODOT and WSDOT standard details will be referenced as appropriate. Landscaping plans will not be included except as noted in Work Element 8.3.8. The stormwater management plan that was developed under Task AD will be updated to comply with the design features developed under this Task.

Input from the CONSULTANT transit team will be included to provide drainage and stormwater management for the project as a whole.

8.3.3 Utility Relocation

The CONSULTANT will prepare draft utility relocation plans for selected utilities. The impacts to the identified existing utilities (relocation, replacement, etc.) and the development of the utility systems on the bridges and within the road prism for the preferred alternative will be updated. A log of preliminary concerns and conflicts for each identified utility impacted that was developed under Task AD will be updated to include the documentation of critical utilities (emergency phone lines and power supply to vital infrastructure), potential schedule and sequencing issues, safety issues, environmental concerns, and utilities that have long lead times, long construction periods and/or high costs associated with relocation.

A potholing plan (see Work Element 8.2.4) will be developed in consultation with the STATE. The plan will focus on those utilities where more detailed data is considered necessary to complete this task.

This work element will include coordinating with the utility companies to address potential issues related to utility relocation and modifications. Conceptual relocation alternatives will be identified for each conflict through an iterative process involving the STATE, and utility owners, as appropriate. Based on the discussions an acceptable preliminary solution will be identified and added to the plan view drawings.

Input from the CONSULTANT transit team will be included to provide utility relocation plans and reports for the project as a whole.

8.3.4 Pavements

A Pavement Design Report is not provided in this task. Pavement designs developed under Task AD will be utilized for developing and updating quantities and costs for this task.

8.3.5 Staging and Traffic Management

The CONSULTANT will prepare draft construction staging plans. The plan sheets will include major traffic stage alignments, each major stage of construction showing areas under construction, areas under traffic and areas of construction under traffic. Critical roadway cross sections will be included on the sheets showing existing, permanent and temporary grades and slopes under construction and areas under traffic. The plans and sections will identify locations requiring temporary retaining walls adjacent to the roadways. Detailed Bridge Staging Plan sheets will not be included, but the roadway staging sheets will be coordinated with the Bridge Designers. This work element will also include developing a preliminary critical path diagram of construction.

In addition to developing staging and traffic management for the highway improvements, the CONSULTANT will incorporate significant transit operations where they may impact or otherwise affect the highway construction staging or traffic management.

8.3.6 Signalization, Signing, Striping, and Illumination

The CONSULTANT will identify locations for new traffic signals and signal revisions, and new and revised ramp meter locations. Draft plans for new and replacement project destination signing will be prepared depicting the location of the existing signs and indicating signs to be removed, relocated, protected, replaced and the location of the new signs to be installed. Striping and illumination plans will not be produced.

This work is to be confined to highway applications. Specific transit signalization, signing, and illumination as necessary will be provided by the Transit Team.

8.3.7 Erosion Control

Erosion control plans will not be developed under this task.

8.3.8 Roadside Development and Environmental Mitigation Plans

The CONSULTANT will prepare conceptual roadside development plans with information sufficient to acquire the ROD.

This work element also includes the development of draft mitigation plans which have been identified during the DEIS comment phase and subsequently implemented into the FEIS. These plans will include grading plans, typical sections, water quality facilities, and planting plans.

8.3.9 Design Documentation Package

The CONSULTANT will produce a partial Design Acceptance Package (DAP) per ODOT requirements for the portion of the Project located in Oregon and a partial Design Documentation Report per WSDOT requirements for the portion of the Project located in Washington with the design information developed in support of developing the FEIS and obtaining the ROD. This will include the following items:

Design drawing package

- Design narrative including an outline of the environmental mitigation measures and known utility conflicts
- Intersection plans for approval
- Interchange plans for approval
- Draft TS & L package for the proposed Columbia River crossing bridges and approaches, and the North Portland Harbor prepared under Work Element 8.4.3
- Preliminary layouts for the proposed landside bridges and walls, prepared under Work Element 8.4.4
- Updated Stormwater Management Plan
- Draft Environmental Mitigation Plan
- Permit requirements
- Total project cost estimate utilizing newly developed design information
- Approved design exceptions/deviations

Assumptions:

- The level of design outlined above will only be provided for the preferred alternative.
- Contents for each design drawing will be consistent with CRC formatting and STATE standards as required.
- Final stormwater concept memorandum prepared under Task AD is approved.
- Architectural and aesthetic elements developed under Task AD are approved for application.
- Rights-of-way plans and updates will be developed in accordance with accepted STATE requirements.
- Utility relocation technical memorandum prepared under Task AD is approved.
- Assembly of the drawing package will be provided under Work Element 8.3.1.
- Design drawings of selected cross-sections, mainline profiles, mainline alignment, interchange alignments, and interchange profiles provided under Task AD will be updated as design refinements occur. Resubmittals will not be made as the information will be presented in the documentation packages.

The STATE will provide comments on design drawings within two weeks of receipt. A maximum of two reviews will be held by the STATE.

The STATE will provide comments on the drawing package, the preliminary Design Acceptance Package, and the preliminary Design Documentation Package within three weeks of receipt. A maximum of two reviews will be held by the STATE.

Deliverables:

The CONSULTANT will provide design plan drawings for the following:

- Alignment and profile plans for mainline and all ramps based on LPA and agreed to resolutions(AF8006)
- Draft drainage plans showing water quality/flow control features(AF8007)
- Draft rights-of-way plans for Oregon (AF8008)
- Draft rights-of-way plans for Washington (AF8009)
- Draft construction staging plans, profiles, and roadway-sections (AF8010)
- Draft utility relocation plans (AF8011)

The CONSULTANT will provide the following design packages:

- Partial Design Acceptance Package (OR) (AF8012)
- Partial Design Documentation Report (WA) (AF8013)

8.4 Structural Design

This task includes the work to complete the Type Size and Location (TS&L) Report for the Columbia River and the mainline North Portland Harbor bridges. This task also includes the work necessary to further develop the conceptual level of design of the landside structures as may be required to determine temporary and permanent disturbance areas in support of environmental documentation and permitting activities. This task does not include the development of TS&L Reports for any landside structures (bridges and walls). The work under this task will build on previous river crossing and landside bridge concepts developed under Task AD. The work under this task will also be based on preliminary subsurface geotechnical exploration and foundation design recommendations provided under Task AD by Washington Department of Transportation Geotechnical staff, and additional preliminary subsurface geotechnical exploration and foundation design recommendations accomplished and developed as part of Task AF.

8.4.1 Main River Crossing and Approach Structures

The CONSULTANT will perform preliminary structural design and analysis on the Columbia River crossing, North Portland Harbor Bridge, and approach structures for the selected locally preferred alternative as appropriate and required for the deliverable prescribed herein.

Development of structure types such as (including steel; or a combined highway and transit bridge (shared facility) in steel, concrete, or a combination of steel and concrete for the river crossing) will be considered at the direction of the STATES. Development will be consistent with requirements established for the project, which are established to be consistent with the ODOT, WSDOT and Tri-Met design guidelines.

Preliminary structure design, analysis findings and option evaluation for the Columbia River crossing and associated approach structures will be summarized in a Type, Size & Location Report prepared for review by project staff, STATE technical representatives and federal reviewing agencies to provide points of concurrence in the design. It is anticipated that the work will consist of the following components: 1) Type Screening, 2) Stakeholder Coordination, 3) Type Study, and 4) Preliminary Design. The report and TS&L drawings will be developed for each structure type advanced to the formal type study phase. The drawings will be consistent with the standards developed for the project.

A TS&L report will also be developed for the mainline North Portland Harbor bridge.

Preliminary design of the structures will consider and evaluate key issues including:

- Superstructure type and configuration
- Substructure type and configuration
- Sizing and configuration
- Constructability
- Geometric requirements
- Utility impacts
- Pedestrian and bicycle accommodations
- Hydraulic requirements
- Navigation requirements
- Architecture
- Airspace requirements
- Seismic performance
- Ship Impact considerations

The preliminary structural design and analysis for the following are not included in this work task:

- Parking garages, transit stations, and associated structures
- Structures associated with electrification systems or track systems.

8.4.2 Landside Structures

The CONSULTANT will perform conceptual structural design on landside bridges. For the purpose of this scope of work, the harbor crossings for transit and the collector-distributor ramps are considered landside structures. Development will be consistent with requirements established by the project for the project, which are consistent with the respective ODOT, WSDOT and Tri-Met design guidelines.

Conceptual structure design and option evaluation for the landside bridges and walls will be presented in a layout package for the purpose of establishing temporary and permanent disturbance areas in support of environmental documentation and permitting activities. The package will be submitted for review by project staff, STATE technical representatives and federal reviewing agencies to provide points of concurrence in the design development of the landside structures.

Conceptual design of the bridges will consider:

- Superstructure sizing and configuration
- Substructure sizing and configuration
- Constructability
- Geometric requirements
- Utility impacts
- Pedestrian and bicycle accommodations

Conceptual design of the walls will consider:

- Wall type and layout
- Constructability
- Utility impacts
- Aesthetics
- Foundation requirements

8.4.3 Coordination

The CONSULTANT will provide oversight and coordinate the landside and river crossing geotechnical work to be accomplished under Task AF. This work is detailed under Subsection 8.9 and 8.10 respectively. The oversight and coordination work will also include attending monthly design meetings at the Project office.

8.4.4 Test Pile/Shaft Program Development

The CONSULTANT will develop a full-scale test pile/shaft program for the foundation(s) developed for the preliminary designs of the main river crossing and Harbor Bridge. The program will consist of plans, specifications and estimated quantities and address construction methods and load capacities for the respective foundation types. The program will also evaluate

potential environmental mitigation measures addressing turbidity, acoustic impact, etc. as may be deemed appropriate based on environmental documentation and permitting activities.

8.4.5 Geotechnical Support

The CONSULTANT will provide a preliminary foundation design recommendation memorandum for the Oregon landside structures (bridges and walls) based on historical data and currently available project geotechnical information.

Deliverables:

The CONSULTANT will provide:

- Final TS&L Package for the main river crossing (AF8014)
- Final TS&L Package for the main river crossing approaches (AF8015)
- Final TS&L Package for the mainline North Portland Harbor bridge (AF8016)
- Preliminary layout package for the landside bridges and walls (AF8017)
- Test/Shaft Pile Program Package (AF8018)
- Preliminary Foundation Design Recommendation Memorandum for Oregon landside structures (AF8019)

8.5 Cost Estimating

8.5.1 Obtain Historical or Other Data for Total Project Capital Costs

Cost data required for the prior estimates will be expanded and updated as required by the CONSULTANT. The data will be based on the Standard Item Table, Bid Tabulations, R.S. Means cost and production rate standards, STATE bridge and highway costs and construction cost trends, TriMet LRT and other transit-related costs, and other representative data as appropriate. Operations and maintenance costs will be developed by the CONSULTANT in consultation with WSDOT, ODOT, TriMet and C-TRAN.

8.5.2 Refine Cost Estimate Templates and Undertake Preliminary Quantity Take-offs

The cost estimate templates prepared as part of Task AD will be refined by the CONSULTANT to reflect changes in the project including any increased level of detail. The estimate summaries will be broken down to show individual overall costs for highway and transit elements for each state. Commercially available estimating software (i.e. Timberline) may be used to facilitate advancing the estimate through final design and construction.

8.5.3 Prepare Base Cost Estimates

Single point base cost estimates will be developed by the CONSULTANT using “Timberline” software for the preferred alternative. The opinions of cost will include construction, operation and maintenance, and long-term preservation costs. They will not include any contingencies or

other allowances for bias, risk and uncertainty. The cost estimates developed will be considered sufficient to support the CEVP study.

Costs will be escalated to mid-2009 dollars using historic trends and other relevant information available from STATE and other local agencies for key cost elements such as earthwork, surfacing, rail track, structures and real estate.

The STATES, TriMet and C-TRAN will be requested to provide feedback on the base cost estimates before they are finalized.

Assumptions:

- Cost estimates will be prepared for the preferred alternative.
- Escalation beyond mid-2009 dollars will be included as part of the CEVP process.
- Base cost estimates developed during Task AD will be used as a basis.
- Highway, transit, bicycle, and pedestrian costs will be included.
- Costs developed during this work element will be utilized in Work Element 8.7.

Deliverables:

- The CONSULTANT will provide a Base Cost Estimate for the preferred alternative (AF8020)

8.6 Aesthetics for Structures and Landsides

The CONSULTANT will further develop the aesthetic design criteria and aesthetic alternative evaluation criteria that were previously established in the *Draft Architectural Guidelines and Aesthetic Assessment Framework* document under Task AC and in conjunction with the Urban Design Advisory Group (UDAG). It is anticipated that the contents of this document will change over time, as each Scope of Work task further develops alternatives.

The CONSULTANT will coordinate with and participate in design workshops for roadway, bridge, and transit for items relating to architectural elements. Design charrettes may be conducted by the CONSULTANT for the CRC team and the public. Participation in public meetings will be held to present the architectural concepts and incorporate public comment to the *Draft Architectural Guidelines and Aesthetic Assessment Framework* document.

8.6.1 Main River Crossing Bridge Coordination

Architectural and aesthetic elements will be provided by the CONSULTANT in conjunction with coordination with the Urban Design Advisory Group (UDAG) for up to three of the Columbia River Crossing options as developed. These elements will be depicted on photo-realistic visualization views of the structures as developed in Work Element 8.4.1. Views of the underside of the bridges will include views from the Oregon shore, the Washington shore, and from the Columbia River. In addition to the shore views, which are to provide a view from ground level, there are to be two views from above, one looking north and the other looking south. These views will include renderings of architectural features including the piers, other substructure

details, and the deck and parapet features where visible. The five views described above will be modified as needed to reflect the preferred alternative once that determination is made.

8.6.2 Landside Features Coordination

In addition to the main river crossings, up to four photo-realistic visualization views will be provided by the CONSULTANT for typical overcrossings and/or ramps that are planned for the preferred alternative. These views are to be from both the freeway level and from the individual structure level. The four views are to be representative of the planned structures and provide the architectural and aesthetic renderings similar to those described for the Columbia River crossing bridges.

In a like manner, up to four photo-realistic visualization views will be provided by the CONSULTANT for walls that are planned for the preferred alternative. The views are to show the proposed details of the exposed wall and be based on the TS&L dimensions. The views are to be from both the freeway perspective and from the adjoining landside.

In addition to the structures, other landside features developed for the preferred alternative during the preliminary design phase, such as plantings, landscaping, and other aesthetic treatments developed in conjunction with the UDAG will be incorporated into the photo-realistic visualization views of the major interchanges.

8.6.3 Visualizations

Architectural and aesthetic elements will be provided by the CONSULTANT for up to two views for each of the preferred alternative interchanges at Marine Drive, Hayden Island, SR-14, Mill Plain, Fourth Plain, and SR-500/39th Street. The views are to be both from the freeway and landside perspective and show the proposed landscaping features and other architectural and aesthetic details planned for the interchanges. The views are to be such that the elevation relationships between different ramps and/or crossings are clearly shown.

In addition to the twelve views described above, two similar photo-realistic visualization views are to be provided by the CONSULTANT to the section between SR-14 and Mill Plain that clearly shows the relationship of the preferred alternative to the theater in downtown Vancouver on the west and the historical military hospital on the east.

Assumptions:

- Architectural and aesthetic elements as developed under Task AC will be utilized as a basis for updating the Architectural Guidelines and Aesthetic Assessment Framework Document.
- Up to six meetings will be held with UDAG, coordinating agencies and the public.
- Work products will be developed to a level that can be used for public outreach events. Up to eight presentation boards will be prepared for use at public events.
- Level of effort will be constrained to the budgeted hours for work under this work element.

Deliverables:

The CONSULTANT will provide:

- Up to 15 photo-realistic design visualization views, for main river crossing alternatives (AF8022)
- Four Photo-realistic design visualization views for landside bridges for the preferred alternative (AF8023)
- Four Photo-realistic design visualization views for walls for the preferred alternative (AF8024)
- Twelve Photo-realistic design visualization views of the major interchanges as described in Work Element 8.6.3 (AF8025)
- Two Photo-realistic design visualization views for the section between SR-14 and Mill Plain for the preferred alternative (AF8026)
- Update of the Draft Architectural Guidelines and Aesthetic Assessment Framework Document (AF8027)

8.7 CEVP/Value Engineering

8.7.1 Value Engineering Preparation and Participation

The CONSULTANT will provide documentation, coordinate, and participate in a formal VE processes to evaluate specific elements of the preferred alternative as designated by the STATE. The VE study will be conducted by the STATE before the CEVP is completed.

8.7.2 CEVP Preparation and Participation

Upon direction of the STATE, the CONSULTANT will participate in a CEVP session to be held at the CRC project office. The session will follow a Value Engineering (VE) study of selected specific elements of the preferred alternative.

Provide up to three staff for three weeks to coordinate and prepare for the CEVP workshop. The CONSULTANT will work with the CEVP team assembled by the STATE.

Summary Base Cost Estimates and a list of potential Risks and Uncertainties will be prepared by the CONSULTANT and submitted to the STATE two weeks prior to the workshop. Flow Charts will be prepared by the CONSULTANT with input from the STATE. The material is intended for use by participants at the workshop.

The CONSULTANT will provide up to four staff to attend the CEVP workshop. The STATE will determine the participants to be involved in the workshop.

Final CEVP reports will be prepared by the STATE. The reports will be reviewed by the CONSULTANT prior to issuance.

Assumptions:

- The VEs and CEVPs will be led by the STATE.
- Each VE study will have a maximum duration of three days.
- The STATE will prepare the VE report.
- Each CEVP workshop will have a maximum duration of five days.
- The STATE will prepare the CEVP report.
- Results from the CEVP process under Task AD will serve as a guide.
- Summary Base Cost Estimates will be provided under Work Element 8.5.3.

Deliverables:

- The CONSULTANT will provide Risk Registers for participants at the CEVP workshop (AF8028)
- The CONSULTANT will provide responses to the VE recommendation.

8.8 Design Support for Other Disciplines

The Highway Engineering team will provide support to other teams as requested. Such support will include preparation of engineering drawings, providing calculations, updating technical reports, providing data bases, providing other documentation, providing technical reviews of documents prepared by others, providing technical advice and consultation, providing engineering data required for permit applications, such as FAA, USCG, USCE, etc., and providing staff attendance at public or other agency presentations.

- Communications Team Support
- Transportation Planning Team Support
- Environmental Team Support
- Transit Planning and Engineering Team Support
- Client Required Training

Assumptions:

- Requests by other teams will provide reasonable response time.
- The level of support is estimated at 0.5 FTE for the duration of the task (780 hours).

Deliverables:

- None

Note: Work Element 8.9 will be split into Phase A and Phase B with only Phase A work included in the Task AF budget. Phase B work will be negotiated separately and added by amendment.

8.9 Geotechnical Engineering Studies for the Columbia River Bridge and Seismic Ground Motion Evaluations

The objective of the field explorations and geotechnical engineering work is to support the CRC Team to complete 30-percent-level studies and design plans for the main CRC and to develop seismic design ground motions and response spectra for TS&L level design effort of the other CRC project structures including the Oregon Slough Bridge.

General Assumptions

- Collectively referred to as the main CRC, the bridges currently proposed to cross the main channel of the Columbia River consist of up to three parallel bridges downstream of the existing I-5 Bridge. One bridge will carry northbound vehicle traffic; one bridge will carry southbound vehicle traffic, and one bridge will carry northbound and southbound transit, bicycle, and pedestrian traffic. An option to use a stacked highway/transit structure will be evaluated by the CRC bridge team. Each bridge will be supported on one land pier (Pier 1) on the Oregon shore, five in-water piers, and one near-shore pier (Pier 7) straddling the north bank. In addition to the seven main channel piers, one landside pier (pier 8) is located further north of Pier 7.
- The landside structures of the CRC project will consist of I-5 on- ramp and off-ramp structures, numerous overcrossings and undercrossing bridge structures, and several retaining walls. At this time, these proposed structure designs are not at the TS&L level, and the final locations and types of these structures have not been completed.
- Based upon the current CRC Project Design Team's knowledge of the site soil conditions, the CRC Project Design Team anticipates that the proposed Columbia River Bridge will be supported on deep foundations extending to the Troutdale Formation except for Pier 8 (on Landside) located at the north end of the bridge. Shallow and deep foundations will be evaluated to support Pier 8. The CRC Project Design Team's investigations to date indicate that the depth to the Troutdale Formation varies from less than 50 feet near the north end of the proposed Columbia River Bridges to approximately 200 feet near the south end of the Columbia River Bridges (see Shannon & Wilson CRC Geotechnical Data dated May 5, 2008).
- Drilling and in-situ testing in borings for the main CRC bridges, Piers 1, 7, and 8, and 4 borings on the Washington side in which suspension logging will be performed will be observed by the SUBCONSULTANT. Similarly, drilling and testing in landside explorations for seismic design will be observed by the SUBCONSULTANT. In addition to drilling and in-situ testing observed by the SUBCONSULTANT, cone penetrometer testing (CPT) will be performed at Piers 1, 7, and 8 but will not be

observed by the SUBCONSULTANT. The project work plan, permits, logistical coordination, and drilling and CPT subcontractors will be provided by the CRC Project Design Team.

- Archeological review of soil samples will be performed by other team members. The results of the archeological review will be submitted by others in a separate report by the CRC Project Bridge Design Team's archeologists under a separate task.
- Testing, handling, and disposal of contaminated materials, if encountered, are not included in this scope of work. SUBCONSULTANT will keep the CRC Project Bridge Design Team apprised of these conditions and potential additional costs if hazardous material is encountered.
- The SUBCONSULTANT will follow the Inadvertent Discovery Plan developed for the project by the CRC Project Design Team. This document outlines requirements for work stoppage and notification should human remains be encountered during exploration activities.
- The CRC project team will provide the necessary design information for the SUBCONSULTANT to perform the geotechnical design activities (i.e. structural plans, foundation schemes, loading criteria, etc.).
- The SUBCONSULTANT will follow the conditions of the environmental and right-of-way permits obtained by the PROJECT team by the State of Washington, State of Oregon, City of Vancouver, and City of Portland.

Scope of Work Summary

The SUBCONSULTANT will coordinate with the CRC Project Design Team to accomplish field observations, laboratory analyses and geotechnical design studies to develop foundation design recommendations for the main CRC bridges and to evaluate site-specific seismic response and related hazards for the CRC project. The scope of work includes the following:

- Observation of geotechnical explorations and in situ testing including standard penetration tests, pressuremeter tests (PMT), and geophysical in-situ tests (Oyo Suspension logging) for Piers 1, 7, and 8 of the Columbia River Bridge;
- Observation of four geotechnical explorations on the Washington side and in situ testing, including standard penetration tests and geophysical in-situ tests (Oyo Suspension logging) to be used in development of CRC seismic ground motions;
- Observation of the landside structure borings adjacent to the main channel to select Cyclic Direct Simple Shear testing samples and geophysical in-situ testing borings;
- Geotechnical laboratory testing to support the design activities;
- Preparation of a Geotechnical Data Report for the main CRC bridges based on Shannon & Wilson (S&W) CRC Geotechnical Data prepared on May 5, 2008, and the supplemental borings, in-situ testing, and laboratory testing for Piers 1, 7, and 8;
- Evaluation of geologic site conditions and preparation of geologic profiles and cross sections;

- Site-specific seismic hazard evaluations, including seismic ground motions, liquefaction potential, ground settlement for the main CRC bridges; and development of seismic design ground motions and response spectra for the other CRC structures including the Oregon Slough Bridge;
- Simplified lateral spreading and slope stability analyses of the Washington and Oregon shorelines adjacent to the main span bridges including seismic mitigation alternative evaluations;
- Geotechnical engineering studies to evaluate foundation alternatives for each of the main span bridge piers and development of recommendations for preferred alternatives for each pier;
- Preparation of a Foundation Design Report for the main CRC bridges;
- Value Engineering support and responses;
- Project meetings, including the CRC design team monthly meetings.
- Project management, including coordination with the CRC team and subcontractor, monthly preparation of a cost report and invoice, and maintenance of contract related documents.
- Project close out.

Role of CONSULTANT

The CONSULTANT will provide seismic design ground motions for all CRC structures, including response spectra and time histories for the main CRC and response spectra for TS&L level design for the other CRC project structures, including the Oregon and Washington landside structures and the Oregon Slough Bridge. Potential near-fault ground motions will be evaluated and, depending on the results of this evaluation, site-specific response spectra may be developed that incorporate near-fault effects. Response spectra for Washington landside bridges will be based on Site Class and may include near-fault effects as appropriate.

This scope of work will include reviewing of geophysical in-situ testing performed in Oregon and Washington landside structure borings.

The CRC Project Design Team will provide logistical coordination between the design team and various subconsultants and subcontractors, and will provide technical support as necessary. CRC through the STATES or other CONSULTANTS will subcontract all drilling, CPT, PMT, and geophysical in-situ testing subcontractors on the Oregon side. The WSDOT geotechnical division will perform all drilling and CPT explorations on the Washington side except for borings in which shear wave velocity measurements (suspension logging) or pressuremeter testing (PMT) will be made. These borings on the Washington side will be performed an independent driller under subcontract to WSDOT. The CONSULTANT will subcontract all PMT and geophysical in-situ testing subcontractors on the Washington side. The CONSULTANT will also collect Shelby tube samples from five Oregon landside borings for Cyclic Direct Simple Shear testing to assist with lateral spreading analysis.

The CRC Project Design Team and WSDOT will provide all permits, traffic control, and site access permission to the WSDOT landside drilling sites. The CONSULTANT will perform the remainder of the scope of work (for these in-situ testing borings). CRC will coordinate the drilling and other subcontractor's activities they are responsible for and will provide timely coordination information to the CONSULTANT.

Project Approach

Note: The project scope consists of two phases. Phase A is the scope needed to be done before June 2009 and is included in the Task AF budget. Phase B is the scope after June 2009 and will be negotiated and added by amendment.

The following sections describe the scope of the CONSULTANT's work.

8.9.1 Task-1: Field Explorations and In-situ testing for Columbia River bridges

Note: Phase A scope consists of one boring at Pier 1 only. PMT and seismic shear wave velocity measurements will be conducted in the boring. No explorations will occur during Phase A at Pier 7 and 8.

Description:

The CONSULTANT will plan, coordinate, and observe the drilling of nine borings total; including Six (6) soil borings and three (3) PMT borings. Three (3) geophysical shear wave velocity tests will be performed in three of the six soil borings. All borings will be at locations provided and field located by the CRC Project Design Team and WSDOT. The proposed depths below the existing ground surface (bgs) and general exploration details of explorations observed by the CONSULTANT are as shown in Table 1 below. The proposed pier locations are shown on the Exploration Plan in Exhibit A.

Table 1 - Proposed Field Explorations

Pier Location	Boring Types	Number of Borings / Depth bgs
Pier 1	Soil Borings	1 / 280 ft.
	PMT Borings	1 / 150 ft.
	Geophysical In-situ Testing	Performed in a soil boring
Pier 7	Soil Borings	2/ 200 ft.
	PMT Borings	1/ 150 ft.
	Geophysical In-situ Testing	Performed in a soil boring
Pier 8	Soil Borings	3 / 200 ft.
	PMT Borings	1/ 150 ft.

	Geophysical In-situ Testing	Performed in a soil boring
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In addition to the explorations observed by the CONSULTANT one CPT will be performed at each of the three piers. All drilling services and CPT services will be provided under subcontracts issued by the CRC Project Design Team (Oregon side) and WSDOT (Washington Side). The geophysical in-situ testing and PMT services in Oregon will be provided by the CONSULTANT. The geophysical in-situ testing and PMT in Washington will be provided by the CONSULTANT. Several of the six soil borings will include piezometers. The CONSULTANT will observe and record the installation of piezometers in these borings. The piezometers will be supplied by the CONSULTANT who will also perform all subsequent monitoring.

Prior to performing the explorations, preparatory work will be required. The CONSULTANT will prepare a Drilling and Sampling Plan (DSP) outlining the exploration program. The plan will include descriptions of field coordination, the anticipated work sequence, equipment and drilling procedures, project communication, handling of investigation-derived waste (IDW), field information reporting, soil sampling, and analytical testing. The CONSULTANT will coordinate with CRC team during development of the DSP. The draft DSP will be submitted to the CRC Team for review. A final DSP will be prepared incorporating comments from the CRC Team and will be provided to the CONSULTANT'S field personnel. The CONSULTANT has previously prepared a Site Specific Health and Safety Plan (SSHSP). The CONSULTANT will use this SSHSP for the field work outlined in this task. This SSHSP will cover the CONSULTANT'S lower tier subconsultant personnel only.

The CONSULTANT will provide geotechnical observation and logging services for the subsurface exploration program at Piers 1, 7, and 8. These services will consist of providing geotechnical observation and logging of all boreholes outlined in Table 1. The CONSULTANT will observe and log the drilling of borings for PMTs and geophysical shear wave velocity tests, and select test locations, and observe the testing and also observe the installation of piezometers in borings for Piers 1, 7, and 8. The CONSULTANT will manage all field aspects of the explorations at these locations and coordinate with the CRC team, or PROJECT archeologists and environmental specialists, as needed, for all boring locations. The borings will be located by the CONSULTANT using GPS coordinates provided by the CRC team. Boring locations will be surveyed by WSDOT or the CRC Team and ground surface elevations will be provided to the CONSULTANT.

The drilling of the nine (9) borings (6soil borings and 3 PMT borings) will be performed using open-hole mud rotary drilling techniques. Samples will be obtained in conjunction with the Standard Penetration Test (SPT) at 5-foot intervals to 100 feet and 10-foot-intervals thereafter. Undisturbed Shelby tube samples will be collected at selected depth intervals based on subsurface conditions. Additional samples may be obtained at selected depths depending on subsurface conditions encountered and proposed testing requirements. All samples will be returned to our laboratory for additional classification and testing. Boring logs of materials encountered will be prepared by the CONSULTANT.

All CPT services will be provided by the CRC team. The CONSULTANT will process the CPT raw data and produce and compile the CPT results. The CONSULTANT will review and compile all PMT and Geophysical In-situ Testing results. Three successful PMTs will be performed in each PMT boring. The PMT borings will be open-hole mud-rotary borings. The testing depths will depend on the materials encountered by the boring. Geophysical in-situ testing will be performed for the entire length of three borings on a 1.5-foot depth interval and will be performed in an open-hole mud-rotary boring.

Assumptions:

- The field exploration program will be accomplished during normal business hours five days per week. It is assumed that archeological review will not delay the field exploration program.
- Three (3) successful PMTs will be performed in each PMT boring. The testing depths will depend on the materials encountered by the boring.
- The CRC team will survey boring locations and provide ground surface elevations in the appropriate project datum. The GPS coordinates provided by the state will be in the project coordinate system. A GPS antenna with 2 to 3 meter accuracy will be an acceptable level of accuracy for the project.
- The CONSULTANT will provide drums for all drilling waste and will be responsible for temporary storage and disposal of all IDW.
- All necessary permits to perform the explorations and all utility clearances will be provided by the STATES and WSDOT.
- All PMT and geophysical in-situ testing borings will be drilled open-hole mud-rotary.
- For budget purposes the CONSULTANT assumes that the PMTs will be performed in independent borings and the geophysical logging will be performed in a designated geotechnical soil boring and not an independent boring.
- CONSULTANT assume that on the Oregon Side, the CRC Team will perform all monitoring of piezometers and provide us with the data, and on the Washington Side WSDOT will perform all monitoring of piezometers and provide us with the data.
- CONSULTANT assume that all the borings in Oregon in which geophysical in-situ testing is performed will use Oyo suspension logging methods.

Deliverables:

- Field logs, CPT logs, shear wave velocity and PMT test results to WSDOT and the CRC Team. (AF8029)

8.9.2 Task-2: Observation of Landside Structure borings

Note: Phase A scope includes: 1) co-observe 1 boring located south of Pier 1; 2) No boring observation will be performed on the Washington side in Phase A.

Description:

The CONSULTANT will co-observe a total of five (5) landside structure borings located south of Pier 1 of the Columbia River Bridge (Oregon Side) and take additional undisturbed soil samples (Shelby tube samples) for Cyclic Direct Simple Shear testing. The lead for observation, sampling, inspection and logging of these borings will be performed by CONSULTANT's subconsultant.

The CONSULTANT will collaborate with the CRC team to identify a total of five (5) geophysical shear wave velocity test locations in Oregon, and develop the testing plans for the individual locations including boring depths and testing details. The test results will be used by the CONSULTANT for development of the landside structure seismic design ground motions and response spectra.

The CONSULTANT will collaborate with WSDOT to identify a total of four (4) geophysical shear wave test locations in Washington, and develop the testing plans for the individual locations including boring depths and testing details. The test results will be used by the CONSULTANT for development of the landside structure seismic soil profiles for development of AASHTO standard response spectra.

Three rotosonic borings will be drilled in the area just north of Pier 8 for cultural resource purposes. The CONSULTANT will co-observe these borings to view coarse fraction samples.

Assumptions:

- The CONSULTANT will be able to select Shelby tube samples from any depth interval appropriate within the five (5) landside structure borings south of Pier 1 and will take possession of those samples.
- The borings in Oregon south of Pier 1 will be logged and inspected by the CONSULTANT. The CONSULTANT will not be responsible for development of the boring logs.
- The borings in Washington north of Pier 8 will be logged and inspected by WSDOT. The CONSULTANT will not be responsible for development of the boring logs.
- Field boring logs and final logs will be provided to CONSULTANT promptly on completion of the boring.
- The five (5) geophysical in-situ tests in Oregon will be provided by the CRC Team and will not be subcontracted by the CONSULTANT.
- We assume that all the borings in Oregon in which geophysical in-situ testing is performed will use Oyo suspension logging methods.
- The four (4) geophysical shear wave velocity tests in Washington will be performed by GeoVision under subcontract to the CONSULTANT.

Deliverables:

- Results of the geophysical in-situ testing (Oyo Suspension logging) will be included in the Landside Seismic Ground Motion Report.

8.9.3 Task-3: Geotechnical Laboratory Testing

Note: Phase A scope of work will be commensurate based upon the one boring.

Description

The CONSULTANT will develop an initial laboratory testing plan and will submit this plan for expert peer review. The initial testing plan will be modified based on the comments from the expert peer review and will be periodically reviewed and updated based on the type of samples and soil actually retrieved.

The CONSULTANT will perform laboratory index testing on the samples collected from the borings scoped in Task-1. In general, soil classifications will be performed on up to 160 samples. Water content determinations will be performed on a representative number of samples (up to 100 total); grain size analyses including hydrometer tests as necessary will be performed on up to 70 samples; and plasticity tests (Atterberg limits) will be performed on up to 10 samples. In addition all cores will be re-logged and photographed in the laboratory. The CONSULTANT will subcontract with a qualified laboratory to perform pH, resistivity, and corrosion tests on at least one sample from each pier location. Up to 8 pH, resistivity, and corrosion tests will be performed.

In addition to the above index testing, soil strength testing, including cyclic (residual strength) direct simple shear and triaxial CU tests will be performed for cohesive soils as necessary to provide engineering parameters for the deep foundation design. For budgeting purposes, a total of 8 cyclic direct simple shear (CDSS) (3 from pier locations and 5 in the Oregon landside borings close to Pier 1), 2 triaxial UU tests and 6 triaxial CU tests have been assumed. The actual number of each type of strength test may be modified depending actual subsurface conditions encountered in the borings and the number of undisturbed samples actually retrieved.

Table 2 – Proposed Laboratory Testing Program

Test	ASTM	Quantity
Soil Classification	D2488	160
Moisture Content	D2216	100
Tube Classification	D2488	20
Atterberg	D4318	10
Sieve Analysis & Hydrometer ¹	D422	60
Cyclic Direct simple Shear	D6528	8
Triaxial c/u w/ press. sat.	D4767	6
Triaxial u/u	D2850	2
Sulfate, Sulfide, Chloride, pH, redox, Resistivity	See below ²	8

¹Hydrometer tests performed when greater than 10 percent of the sample passes the No. 200 sieve.

² Sulfate & Chloride - EPA 300.0, Sulfide - ASTM 4500, pH - EPA 9045B, Resistivity - ASTM 9050M/ EPA 120.1, Oxidation reduction potential (redox) - ASTM 2580B-modified

Assumptions

- All laboratory testing will follow the most current applicable ASTM standards and the current STATE requirements.

Deliverables

- Initial laboratory testing plan and periodic updates will be provided.
- The results of the laboratory tests will be presented in the Geotechnical Data Report.

8.9.4 Task-4: Geologic Profiles and Geotechnical Data Report

Note: Phase A scope will consist of development of updated geologic profiles to include Pier 1 area and newly obtained subsurface data. No draft GDR will be developed in Phase A. The budget reflects the reduced borings and lab testing under Phase A.

Description:

The CONSULTANT will perform a geologic review of the soil samples and laboratory test results and prepare summary boring logs characterizing the various geotechnical / geologic units based on their engineering properties and test results. The soil units on the boring log will include soil descriptions of the geotechnical soil and rock units, the results of in-situ tests, and the results of laboratory index tests. The CONSULTANT will use the geotechnical data and prepare geologic interpretations to develop three (3) geologic profiles along the bridge alignments in the main span Columbia River bridges using the S&W Geotechnical Data (May 5, 2008) and the supplemental borings at Piers 1, 7, and 8. The profiles will extend landside from the ordinary high water approximately 1000 feet for lateral spreading study purposes. The CRC design team and WSDOT will provide the landside borings to the CONSULTANT as needed for these analyses. Eight (8) additional geologic cross sections will be developed perpendicular to the bridge alignments at pier locations.

The CONSULTANT will compile all field explorations, in-situ testing, and laboratory test results, and develop a Geotechnical Data Report (GDR) for the main span Columbia River Bridges by using the S&W Geotechnical Data dated May 5, 2008, and supplemental borings, in-situ testing, and laboratory testing. The GDR will not include any geotechnical data from non bridge pier borings except for CDSS results identified in Task-2. All non bridge piers boring information will be provided to WSDOT and CRC for their use and distribution.

Assumptions:

- The CRC design team will provide bathymetry and landside surveys in AutoCAD format to the CONSULTANT.

- The CRC design team and ODOT will furnish boring logs within 1000 feet of the river's shoreline for lateral spreading analysis.

Deliverables:

- Draft and final geotechnical data report (GDR) will be provided to the CRC team. (AF8030)
- Interpretive geologic profiles and cross sections will be presented in the Geotechnical Foundation Design Report, Task 8. (AF8031)

8.9.5 Task-5: Site-Specific Seismic Ground Motion Evaluations

Design Ground Motions

Ground motions are required for the 30-percent- design of the main CRC, TS&L design of the other CRC project structures, and inclusion in a design/build RFP. The design ground motions shall be developed in accordance with and meet the requirements of the “CRC Structural Design Criteria for the Columbia River Crossing”

The design criteria identify Safety Evaluation Earthquake (SEE) and Functional Evaluation Earthquake (FEE) ground motion levels. Ground motion return periods for the SEE and FEE design levels are summarized below:

Table 3 – Ground Motion Return Periods

Structure	FEE	SEE	
	500-yr	1000-yr	2500-yr
Main CRC	X		X
Oregon Slough Bridge	X		X
NB-T1/SB-T1 Structure (Hayden Is.)	X		X
ODOT Landside Bridges and approaches	X	X	
WSDOT Landside Bridges		X	

Smoothed acceleration response spectra (ARS) are required for the following bridge structures and conditions.

Table 4 – Smoothed Acceleration Response Spectra

Structure	FEE		SEE	
	Non-linear Effective Stress Analysis (Liquefied Condition)	Equivalent Linear Total Stress Analysis (Non-liquefied Condition)	Non-linear Effective Stress Analysis (Liquefied Condition)	Equivalent Linear Total Stress Analysis (Non-liquefied Condition)
Main CRC	ARS at mud line	ARS at mud line	ARS at mudline	ARS at mudline
Oregon Slough Bridge	ARS at mud line	ARS at mud line	ARS at mudline	ARS at mudline
NB-T1/SB-T1 Structure (Hayden Is.)	ARS at ground surface	ARS at ground surface	ARS at ground surface	ARS at ground surface
ODOT Landside Bridges and approaches	ARS at ground surface	ARS at ground surface	ARS at ground surface	ARS at ground surface
WSDOT Landside Bridges			ARS at ground surface	ARS at ground surface

Note: Site-specific ARS described in Table 4 will be done in Phase B. For Phase A, response spectra will be developed using code-based site class definitions or those already submitted in preliminary design documents.

Three sets of spectrally matched or scaled time histories corresponding to each main-CRC-structure ARS case listed in Table 4 are also required for each pier. The number of time history sets for design ground motion levels and liquefied/non-liquefied soil conditions are summarized in Table 5.

Note: Limited time history development will be done in Phase A for one in-river pier selected to be most susceptible to liquefaction.

Table 5 – Proposed Number of Time History Sets per Pier¹

FEE		SEE	
Liquefied	Non-liquefied	Liquefied	Non-liquefied
3 sets	3 sets	3 sets	3 sets

¹Main CRC has 8 piers.

Each set will include 2-horizontal orthogonal components and one vertical component. The location and number of application points of a time history set (e.g, mudline, base of column, top of pile/shaft cap, or regular depth intervals along the depth of the piles/shafts) for 30-percent design has not yet been determined but will be determined by the CRC team later in design. If only a single point of application is needed for a given pier, the time history set for that pier will consist only of three components (2 horizontal, one vertical). If multiple points of application down the length of the pile/shaft are needed, the time history set would consist of corresponding multiple horizontal and vertical motions.

For the “liquefied” condition, non-linear effective stress analysis will be used to allow pore pressure development in the site response analyses. Therefore, the liquefied time history sets would correspond to smoothed site specific design spectra that incorporate softening due to the effects of pore pressure development of the subsurface soils. For the “non-liquefied” condition, equivalent-linear total stress analysis will be used in the site response analyses. Therefore, the nonliquefied time history sets would correspond to smoothed site specific design spectra that do not explicitly consider softening due to the effects of pore pressure development of the subsurface soils.

Description:

The SUBCONSULTANT will perform site-specific ground response analyses using both total stress equivalent linear and, where potentially liquefiable soils are present, effective stress nonlinear methods. Site soils may experience nonlinear effects due to liquefaction and generation of excess pore pressure during the design ground motion. In this case, equivalent linear total stress ground response analyses, (e.g., Shake2000) could provide unreliable results as it does not directly model the effects of pore pressure generation. Therefore effective stress nonlinear analyses (e.g., D-MOD2000) will also be performed with output that will include excess pore pressure ratio versus depth and time.

Uniform hazard spectra (UHS) for the given return period or probability of exceedance will be determined from the 2002 U.S. Geological Survey (USGS) probabilistic seismic hazard analysis (PSHA) and as adopted in AASHTO 2008. The CONSULTANT shall review the PSHA and recent published, peer-reviewed literature regarding seismogenic sources that may affect the estimated ground motion hazard at the site. If based on this review the CONSULTANT determines that new information regarding seismogenic sources could appreciably alter UHS determined from the USGS PSHA, the CONSULTANT will notify the CRC Team.

Note: Highlighted portion moved to Phase B

For the site response analyses, the CONSULTANT will use a minimum of seven time histories. The CONSULTANT will use the deaggregation information from the 2002 USGS PSHA at both the SEE and FEE ground motion levels to evaluate earthquake sources, magnitudes, and distances that are significant contributors to the SEE and FEE ground motion hazard levels. The time histories will be representative of the seismic sources that are significant contributors to the ground motion hazard for the given design level. The time histories will be spectrally matched and/or arithmetically scaled so that the geometric mean of the scaled time histories is approximately equal to the given UHS over the period range of interest for the bridge. For time

histories representing distinctly different source zones (e.g., shallow crustal versus subduction zone), the time histories may be spectrally matched to different spectra, each of which is representative of one of the significant seismic sources. However, the different spectra in aggregate will envelope the UHS over the period range of interest for the bridge.

Note: For preliminary design analyses, Phase A will include only 3 time histories. Additional time histories will be used in Phase B to bring the total up to seven. For Phase A, the time histories will be scaled to approximate the USGS UHS, which is defined out to 2 seconds. Phase A will only use arithmetic scaling.

The soil profile and dynamic soil properties, including shear wave velocity profile, are key parameters in site-specific site response analyses. Therefore, the CONSULTANT will consider potential variations in the soil profile (including depth to rock) and dynamic soil properties (including shear wave velocity profiles) at each pier.

Note: Phase A will be for a single profile at pier with deep alluvium (+/-200'). The results of the analyses will be used to assess liquefaction and excess pore pressure in the profile on soil shear strength and effects on vertical and lateral foundation capacity. For Phase A, the results of the analyses will be extrapolated to other piers, bridges and structures (i.e., other main crossing bridge piers, Oregon Slough, Hayden Island) for Phase A

The CONSULTANT will provide smoothed horizontal and vertical design spectra at the mudline /ground surfaces for the ground motion return periods and liquefied/non-liquefied conditions indicated in the tables in this section of the scope. Horizontal spectra will be based on the results of the site response analyses or for the landside structures, Site Class spectral shapes with appropriate potential modifications for near-fault effects. Vertical spectra may be developed based on use of appropriate vertical-to-horizontal spectral ratios and the site-specific horizontal spectra.

Note: The work outlined in the above paragraph will be completed in Phase B.

The CONSULTANT will provide ground motion time history sets for the ground motion return periods and liquefied/non-liquefied conditions indicated in the tables in this section of the scope. The time histories will correspond to smoothed horizontal and vertical design spectra. For time histories representing distinctly different source zones (e.g., shallow crustal versus subduction zone), the time histories may be spectrally matched to different spectra, each of which is representative of one of the significant seismic sources. However, the different spectra in aggregate will envelope the smoothed design (target) spectrum. The CONSULTANT will consider and incorporate spatial variation in earthquake time histories between different bridge supports for the time history sets. Specifically, wave-passage, scattering/incoherency, and local site response shall be considered and incorporated into the time history sets as appropriate.

Note: The work outlined above will be moved to Phase B. The Phase B work may be revised for this task assuming that projects design requirements will be better defined at the end of Phase A.

Assumptions

- The CRC Team will provide the period range of interest for the proposed bridge. This work will not be critical for Phase A.
- The UHS will be determined from the 2002 USGS PSHA and as adopted in AASHTO 2008. The scope of services does not include a site-specific PSHA but does include a review of the most recent, published peer-reviewed literature to determine if a site-specific PSHA would be advisable.
- If the twice period range of interest ($2T_F$) is greater than that provided by the 2002 USGS PSHA (i.e. 2 seconds), we would extrapolate the UHS as required. This will be addressed in Phase B.
- Dynamic shear modulus and damping reduction curves and soil property inputs into the non-linear effective stress analysis would be based on a combination of published empirical data and CDSS testing performed for this project.
- The stratigraphy and range of response of the site stratigraphy to seismic excitation will be assessed using approximately 16 to 20 one-dimensional soil models. All soil models will be analyzed using both equivalent linear (e.g., SHAKE) and non-linear (e.g., D-MOD) dynamic analyses. The soil models will be based upon developed geologic profiles and will be representative of bridge pier locations. Phase A will be one model. Phase B will include the remaining models.
- Because of varying soil conditions along the alignment, more than one smoothed ARS could be developed for a long span structure. Phase A will be addressed on a preliminary basis in the preliminary geotech design documents. No additional analysis will be provided until Phase. B.
- If an effective stress analysis, such as D-MOD, is used to assess liquefaction, it shall be peer reviewed in accordance with the “Seismic Design Criteria for the Columbia River Crossing Project.” The STATE would provide the peer reviewer consultant. The peer review will take approximately 2 weeks and may be done at various stages in the analyses. Peer review will be included in Phase B.

Deliverables

- Up to 4 technical memorandum will be provided during the evaluations. Phase A will provide 1 technical memorandum addressing limited site response analysis with the remaining memos in Phase B. (AF8032)
- A draft and final Seismic Ground Motion Report will be prepared. This report will summarize the results of the site-specific ground response analyses and provide spectra and ground motion time history sets for seismic design of the project, including bridges. This work will be completed in Phase B. (AF8033)

8.9.6 Task-6: Liquefaction and River Bank Stability Assessment

Description:

8.9.6.1 Task 6.1 Liquefaction Assessment

The CONSULTANT will provide a liquefaction assessment of the subsurface conditions along the main CRC and within 1,000 feet of each shoreline. The CONSULTANT will use empirical liquefaction methods (e.g., Youd, et al., 2001) that will utilize a combination of data available from the SPT, CPT, and shear wave velocity testing. The CONSULTANT will compare the empirical cyclic resistance ratio (CRR) to the cyclic stress ratio (CSR) to determine if liquefaction will occur.

Non-linear effective stress analysis (e.g., D-MOD) will be completed during Task 5 for the Columbia River Crossing and will provide an estimate of pore pressure ratio versus depth for the FEE and the SEE ground motion time histories. Therefore, the CONSULTANT will also utilize the results from the non-linear effective stress analysis to estimate liquefaction potential for the Columbia River Crossing.

Note: Much of the site response in Task 5 will be in Phase B. Phase A will include only an assessment based on a non-linear effective stress analysis at one in-river pier location. The results of this non-linear-effective-stress-analysis assessment will be extrapolated to other locations for Phase A. Additional non-linear site response analyses will be performed at other pier locations in Phase B. The liquefaction assessment will be updated in Phase B based on these additional site response analyses.

CDSS laboratory testing will be performed on some representative relatively undisturbed samples obtained during the subsurface exploration program. The CONSULTANT would compare the number of cycles required to produce initial liquefaction versus CSR utilizing both the empirical methods and CDSS lab test results.

Assumption:

- Ground motions required for this task will be developed during Task 5.

8.9.6.2 Task 6.2 Empirical and Pseudo-static Limit-equilibrium Stability Analysis

Note: Analyses for this task will be conducted in Phase A and will be reviewed/updated in Phase B based additional work completed in Phase B.

The CONSULTANT would estimate the stability of the three representative cross sections using the analysis methodology for non-liquefied and liquefied conditions as described below. The CONSULTANT would use empirical procedure and pseudo-static limit equilibrium slope stability analyses methods to evaluate stability.

The CONSULTANT would use empirical procedures to estimate lateral spreading displacements and/or pressures associated with flow failure (i.e. Brandenburg et al. (2007) or Brandenburg et al. (2003) and Youd et al. (2002)).

At three representative cross sections the CONSULTANT would perform a pseudo static limit-equilibrium stability analyses using the software SLOPE/W to estimate the factor of safety against instability for the post-seismic (liquefied) case. Where there are existing or proposed pile foundations, the bridge foundation elements would be modeled in SLOPE/W as homogenized, composite elements. The composite element's properties would be determined based on an area- or volume-weighted average of the soil and structural element.

For Non-Liquefied Conditions the CONSULTANT would use inertial forces based on $\frac{1}{2} \text{PGA}_{\text{soil}}$ for limit equilibrium pseudostatic analysis to calculate the slope stability factor of safety (FS). If the slope stability factor of safety (FS) is greater than 1.1, deformation analysis would not be required but would be considered. If the FS is less than 1.1 but greater than 1.0, a slope deformation analysis using an empirically calibrated simplified Newmark sliding block analysis methodology (e.g., Makdisi and Seed, 1978; Bray and Rathje, 1998) is required and the impacts of that deformation assessed to justify the use of a FS less than 1.1. The uncertainty in the deformation prediction would be considered when assessing the potential impact of the deformation (e.g., use mean + 1 SD for deformation prediction such as obtained from Bray and Rathje 1998). If the FS for non-liquefied conditions is less than or equal to 1.0, assume slope failure will occur and that deformations will be large. Ground stabilization and preliminary mitigation measures would be evaluated under these conditions.

For Liquefied Conditions the CONSULTANT will assess level of inertial forces, if any, to be used with the residual soil strength. This assessment will consider the results of effective stress non-linear site response analyses. If the slope stability Factor of Safety (FS) for liquefied conditions is equal to or greater than 1.1, deformation analysis is not required, but would be considered. If the factor of safety for liquefied conditions is less than 1.1 but greater than 1.0, a lateral spreading deformation analysis using an empirically calibrated methodology (e.g., Youd, et al. 2002, Kramer 2008) is required and the impacts of that deformation assessed to justify the use of a FS less than 1.1. The uncertainty in the deformation prediction would be considered when assessing the potential impact of the deformation (e.g., use mean + 1 SD for deformation prediction such as can be obtained from Bray and Rathje 1998, or use deformation estimate that represents 7% probability of exceedance in 75 years per Kramer 2008). If the factor of safety for liquefied conditions is less than or equal to 1.0, assume flow failure will occur and that deformations will be large. Ground stabilization and mitigation measures would be evaluated under these conditions.

Assumptions:

- The STATE and CONSULTANT would meet to review available subsurface information and select the three representative cross-sections that the range of subsurface conditions present at the abutments and/or scour holes in the river and slough.
- Topography and bathymetry will be provided at a 2-foot or less contour interval along the main CRC and onshore alignment.
- The STATE will provide sufficient on-land soil borings for a distance of approximately 1,000 feet from the shoreline at the location of the proposed cross-sections. At least two

borings at each cross-section would be drilled a minimum of 50-feet into the Troutdale formation.

Deliverables:

- A preliminary and final letter will be prepared to summarize the results of the liquefaction and stability analyses, and provided to the STATE. (AF8034)

Note: The preliminary letter will be prepared in Phase A. The final letter will be completed in Phase B based on updates/reviews completed in Phase B.

- The summarized liquefaction and stability analyses results will be presented in draft and final geotechnical reports.

8.9.7 Task-7: Geotechnical Engineering Studies for Foundation Design

Note: The majority of the scope for Task 7 will be performed in Phase A. However, the budget reflects fewer analyses in Piers 1, 7, and 8. A total of up to 7 memos will be submitted to address preliminary engineering conclusions and recommendations.

Description:

The SUBCONSULTANT will perform geotechnical engineering studies to evaluate foundation alternatives for the Columbia River Bridge Piers and develop geotechnical recommendations for the preferred foundation alternative for each pier. The engineering studies will include following:

- Evaluate soil and rock properties and parameters for geotechnical analysis based upon the borings, laboratory test results, CPTs, PMTs, and in-situ geophysical testing. Undrained residual strength from the CDSS testing will be incorporated into the soil properties for liquefied or partially liquefied conditions, as appropriate.
- Evaluate axial compressive and uplift capacities for three single large diameter open-ended driven pipe piles and two large diameter drilled shafts under static, seismic, and extreme scour loading conditions for a total of twenty four (24) pier foundation locations.
- Evaluate bearing capacity and settlement of shallow foundations for Pier 8 located at Washington onshore under static, seismic, and extreme flood loading conditions.
- Develop p-y curves at representative depth increments and soil parameters for lateral pile resistance analysis (DFSAP and LPILE) based upon borings, CPTs, and PMTs, as well as literature research studies for the static and seismic and extreme flood loading conditions for a total of twenty four (24) piers.
- Develop pile group or drilled shaft group p-y curves at representative depth increments and soil parameters under vertical and lateral combined loadings for static, seismic, and extreme scour conditions for a total of twenty one piers by aid of 3-D GROUP program. The analysis will require numerous structural inputs due to consideration of potential group effects.

- Develop side resistance t-z and end bearing Q-u curves for axial pile resistance and input into the time history analysis. At each of the twenty four piers CONSULTANT will develop t-z curves at representative depth increments and end bearing Q-u curves. Curves will be based upon subsurface conditions disclosed by the explorations as well as literature research studies for the static and seismic loading conditions.
- Evaluate potential influence of seismic lateral spreading or flow failure on the pile or drilled shaft group for the piers close to onshore using analytical methods. Evaluate conceptual mitigation measures as may be required to meet project design requirements.
- Attend peer review meetings with the CRC team to evaluate preferred deep foundation types and pile groups for each pier.
- Refine the pile axial compressive capacities and soil and pile parameters for the preferred design alternative for each pier, and develop geotechnical recommendations for structural design use.
- Evaluate constructability of the preferred deep foundations including potential risks during construction, drivability (wave equation) and develop preliminary construction considerations for a total of twenty four (24) piers.

Assumptions:

- The main CRC consist of three bridges. Each bridge will be supported by eight (8) piers. A total of twenty four (24) piers will be evaluated for the foundation alternative analyses and design.
- Alternative deep foundation types for each pier location considered by the CRC team include 42-inch, 72-inch, and 96-inch diameter driven open-ended pipe piles, and 8-feet and 10-feet diameter drilled shafts.
- Shallow Foundations will be evaluated only for Pier 8 located on the Washington abutment.
- The CRC team will provide for CONSULTANT the maximum scour depth at each pier location.
- A total of up to ten technical memoranda will be provided during design period to address various foundation alternative studies, engineering analyses, geotechnical design parameters and recommendations on the preferred foundation type for each pier location and geotechnical design for structural design use.

Deliverables:

- Up to ten (10) geotechnical design memoranda (AF8035)

8.9.8 Task-8: Preparation of Geotechnical Foundation Design Report

Note: Task 6.9.8 deferred to Phase B.

Description:

The CONSULTANT shall prepare a draft and final Geotechnical Foundation Design Report (GFDR) for the project site presenting the results of engineering analyses and geotechnical design recommendations for the Columbia River Bridge foundations.

Assumptions:

- The GFDR will provide design parameters for use by the design team based on interpretations of the pressuremeter, CPT, shear wave velocity profiles, borings and other tests and interpretations.
- This report will present the results of the liquefaction and lateral spreading analyses.

Deliverables:

- Prepare a draft GFDR for design team comment that summarizes the findings of the investigation and design recommendations. Provide 4 bound hard copies and 1 electronic copy of the draft GFDR. (AF8036)
- Prepare a final GFDR that summarizes the findings of the investigation and design recommendations. Provide 10 bound hard copies and 1 electronic copy of the final GFDR. (AF8037)

8.9.9 Task-9: Value engineering (VE) support and responses

Note: Task 8.9.9 deferred to Phase B.

Description:

The CONSULTANT will, as requested, prepare and provide geotechnical related documents, and participate in formal VE processes to evaluate specific geotechnical elements of the preferred alternative as designed by the WSDOT and ODOT.

Assumptions:

- The VE study will be conducted by WSDOT before the CEVP is completed.
- Two memorandums will be prepared and provided for the VE study.

Deliverables:

- Prepare a memorandum to provided information required for the VE study. (AF8038)
- Prepare a memorandum to address the results of evaluation of specific geotechnical elements. (AF8039)

8.9.10 Task-10: Project Meetings

Note: Phase A will include 10 meetings and Phase B will cover the remaining meetings.

Description:

The CONSULTANT shall participate in up to a total of twenty (20) project meetings including twelve (12) monthly CRC design team meetings and eight (8) meetings for various technical meetings with the CRC team during the course of the investigation to share information and to present the findings and results of the geotechnical investigation.

Assumptions:

- All meetings will be held at the CRC project office in Vancouver, Washington.
- Two to four personnel from the CONSULTANT will attend each project meeting dependent on the types of meetings.
- Each meeting will take eight (8) hours including traveling time.

Deliverables:

- Prepare written meeting notes as required. (AF8040)

8.9.11 Task-11: Project Management and Administration**Description:**

- The CONSULTANT shall provide appropriate direction and guidance for the - CONSULTANT'S staff working on this project. Oversight and review shall be provided over the course of the entire project. The CONSULTANT shall provide QA/QC for all CONSULTANT's services performed under this scope of work in accordance with the CONSULTANT'S QA/QC standards. The CONSULTANT shall perform the project management and administrative tasks as follows: Prepare and submit invoices, including a tabulation of hours expended for each item.
- Prepare and submit cost report electronically.
- Maintain Contract related documents.
- General project management including coordination with the CRC team.

Assumptions:

- Monthly Invoices shall be due by the 15th of the month.
- Monthly cost reports (electronic) shall be due by the 12th of the month.
- The CONSULTANT shall maintain all contract-required documentation.
- Monthly Invoices
- Monthly Cost Reports

Note: Task AF budget for Work Element 8.10 has not been included and will be added by amendment. This work element may be modified by amendment pending approval of the budget.

8.10 Geotechnical Exploration for the Tier 1 phase of the Oregon Landside Bridge and Structures

The geotechnical exploration will investigate the subsurface ground conditions, groundwater characteristics, and possible adverse subsurface conditions, to support the design of the Oregon Landside Bridges and Structures.

The exploration program will be executed by the CONSULTANT who will oversee rotosonic drilling, mud rotary drilling, cone penetrometer testing (CPT), and groundwater level monitoring. The first phase (Tier 1) subsurface explorations are planned along the project alignment during August through December, 2008. A second phase (Tier 2) may follow depending upon the TS&L delivery date. The remaining explorations will be completed to support the final design of the subject structures.

Rotosonic borings will be advanced up to 280 feet below ground level along the project alignment to obtain representative samples of coarse-grained soils. Thirteen rotosonic borings are planned for 2,820 feet of total drilling footage. Continuous soil samples will be obtained during rotosonic drilling.

Mud rotary borings will be advanced up to 280 feet depth to obtain in-situ soil strength data and relatively undisturbed samples for soil strength testing and consolidation testing. Twenty four borings are planned for 4,820 feet of total drilling footage. Soil samples will generally be collected at 5-foot intervals up to 100 feet in depth and at 10-foot intervals below that.

Cone Penetrometer Test (CPT) probes are planned along the project alignment. Shear wave velocity measurements will be conducted within the CPT probes to obtain data for seismic design. CPT probes will be advanced to refusal in gravel. Twelve probes are planned for 2,795 feet of total footage. CPTs will provide a continuous readout of tip resistance, sleeve friction, and pore pressure measurements. In addition, CPTs will be conducted using a seismic cone to obtain a shear wave velocity profile at 5-foot intervals in select holes.

Strength and deformation characteristics of in-situ soils will be investigated using a Pressuremeter Testing (PMT) device in accordance with ASTM D4719.

Stiffness and velocity characteristics of in-situ soils will be investigated using downhole suspension logging.

Monitoring wells - open standpipe or vibrating wire piezometer (VWP) transducers – will be installed in selected borings. Open standpipe wells will be constructed of 2-inch ID (internal diameter) PVC casing with a 15-foot long machine slotted tip set in a sand pack. VWP transducers will be grouted in-place.

Falling head permeability tests are to be conducted in rotosonic borings to determine permeability of the Sand/Silt Alluvium, Gravel Alluvium, and Troutdale Formation.

Groundwater levels will be taken at the start of each drilling day using a hand-held electronic water level indicator in both rotosonic and mud rotary boreholes. Daily water levels will be recorded on the draft borehole logs.

Groundwater level readings will be collected monthly in project monitoring wells. In addition to monthly readings, automated data loggers will be installed at one or more project monitoring wells to record groundwater levels at regular intervals. The sampling rate will be selected to measure tidal influence (if any) on groundwater levels at the monitoring location(s).

Deliverables:

The CONSULTANT will provide:

- Draft and final Geotechnical Data Report (AF8041)

9.0 IMPLEMENTATION PLAN

The purpose of this work element is to continue the preparation of strategies on alternative delivery systems and related work required to deliver and package individual construction projects, to perform constructability reviews, and to develop RFQ's and RFP's for potential construction projects.

9.1 Implementation Project Management and Quality Control

This work includes the coordination and management of the CONSULTANT team in the delivery of the implementation plan. Other work includes forming and managing work groups, reviewing work products and managing meetings.

9.2 Complete Research of Alternative Delivery Systems

Review applicable delivery systems for the CRC project. Utilizing preliminary staging plans, develop potential construction packages and the most likely and preferable delivery method for each. These packages will be vetted through a working group of states staff and private sector contractors. Once participants are selected and approved by the STATES, an initial meeting to present the project and current work items will be held. Up to six subsequent meetings will be held to develop and synthesize proposals.

Assumptions:

- The working group will consist of 3 DOT members, 4 private sector contractor/AGC members and 2 consultant members.
- The states will provide key staff for participation in work groups and review of draft products. The states will approve the contractor/AGC members from a list of potential personnel supplied by the consultant.
- Private sector contractors will be reimbursed for expenses by the STATE.

Deliverables:

- The consultant will provide up to 21 construction package proposals with a preferred delivery method for each. (AF9001)

9.3 Conduct Integrated Constructability Workshop

The consultant will conduct constructability workshops on the main river crossing and major interchanges. The emphasis will be on safe movement of traffic through the work areas and providing maximum worker safety while constructing the components in the most expedient and inexpensive manner possible.

Participants will include staff from the states, technical experts from the consultant team and outside experts with extensive large project construction experience. The consultant will prepare a list of potential participants who have large contract experience and/or are familiar with local conditions. The states will review and add additional state, city or private individuals for a total group not to exceed 15.

The consultant will provide participants with proposed construction packages, pre-30% design staging and construction plans, preliminary cost information, and other materials prior to meetings.

Assumptions:

- The construction packages from task 9.2 will be the basis for evaluating constructability.
- A minimum of 3 4-hour meetings to discuss, investigate and propose solutions to constructability issues will be held. Prior approval of meetings in excess of the 3 will be required from the states prior to scheduling.
- Changes to plans will be sent to participants for their review and comments.
- CRC staff will be available for presentations and explanations at meetings.
- Private individuals will be reimbursed for expenses and city staff may by agreement have their salaries covered by the STATE.

Deliverables:

- The CONSULTANT will prepare 3 constructability memorandums: Oregon Interchanges, Columbia River Structures and Washington Interchanges. The

memorandums will itemize constructability items discussed and present their resolutions or concerns.

9.4 Update and Revise Draft Implementation Plan

The consultant will take the draft implementation plan produced in Task AD and refine it to reflect the adopted LPA, funding strategies and staging plans. This draft will likely become the final document although changes in philosophy will continue throughout the project's life as additional information becomes available.

Assumptions:

- The plan produced in task AD has been reviewed and accepted by the STATES.

Deliverables:

- The CONSULTANT will provide a revised Draft Implementation Plan. (AF9002)